VERITAS NetBackup™ 4.5 for SAP

System Administrator's Guide

Windows NT/2000

VERITAS

Contents

Preface

This guide describes how to install, configure and use VERITAS NetBackup SAP Extension for Oracle on a Windows NT platform. In this guide, VERITAS NetBackup for SAP on Windows Extension for Oracle is referred to as NetBackup for SAP on Windows.

For specific information about the NetBackup Server software, refer to:

◆ *NetBackup System Administrator's Guide - UNIX*, if you have a UNIX server,

   or

◆ *NetBackup System Administrator's Guide - Windows NT/2000* if you have a Windows NT/2000 server.

This document is the same as `NetBackup_AdminGuide_SAP_NT.pdf` distributed with the NetBackup for SAP on Windows software.

Audience

This guide is intended for the:

◆ Oracle database system administrator responsible for configuring and using the SAP system to back up and restore Oracle databases.

◆ The NetBackup system administrator responsible for configuring NetBackup.

A system administrator is defined as a person with system administrator privileges and responsibilities.

This guide assumes:

◆ A basic understanding of system administration.

◆ You have a working understanding of NetBackup client and server software.

◆ You are familiar with the information covered in the following NetBackup manuals:

 - *NetBackup System Administrator's Guide - UNIX* or *NetBackup System Administrator's Guide - Windows NT/2000*

 - *NetBackup Troubleshooting Guide - UNIX* or *NetBackup Troubleshooting Guide - Windows NT/2000*

◆ A thorough understanding of the SAP environment.

Accessibility

NetBackup contains features that make the user interface easier to use by people who are visually impaired and by people who have limited dexterity. Accessibility features include:

◆ Support for assistive technologies such as screen readers and voice input (Windows servers only)

◆ Support for keyboard (mouseless) navigation using accelerator keys and mnemonic keys

For more information, see the NetBackup system administrator's guide.

Organization

This guide is organized as follows:

◆ The Introduction contains an overview of NetBackup for SAP on Windows terminology and a technical overview of the NetBackup for SAP on Windows `backint` interface.

◆ Installation provides instructions on installing NetBackup and the NetBackup for SAP on Windows software.

◆ The Advanced Installation Instructions chapter provides details on the integration of NetBackup for SAP on Windows software with Microsoft's Systems Management Server (SMS).

◆ Configuration has instructions for configuring your installation. You will also find troubleshooting and debugging instructions in the this chapter.

◆ Using NetBackup for SAP on Windows NT provides operating instructions for your installing of NetBackup for SAP on Windows.

◆ The Troubleshooting chapter describes the various Troubleshooting tools available with NetBackup for SAP on Windows.

The manual also contains the following Appendices.

◆ Appendix A, "NetBackup for SAP `backint` Command Line" describes the `backint` command line.

◆ Appendix B, "`backint -i in_file` Contents" describes the `in_file`.

◆ Appendix C, "`backint -o out_file` Contents" describes the contents of the `out_file`.

◆ Appendix D, "Environment Variable" describes the environmental variables.

◆ Appendix E, "`bp.conf` File" describes the `bp.conf` file.

◆ Appendix F, "`backint -p par_file` or `initSID.utl` Contents" describes the contents of the `par_file`.

In addition to these chapters, there is a glossary of terms that you may encounter when using and discussing NetBackup.

Related Documents

The following documents provide related information. For a more detailed listing of NetBackup documents, refer to *NetBackup Release Notes*.

If you have a UNIX server, refer to these documents:

◆ *NetBackup System Administrator's Guide for UNIX*

Explains how to configure and manage NetBackup on a UNIX system.

◆ *NetBackup Media Manager System Administrator's Guide for UNIX*

Explains how to configure and manage the storage devices and media on UNIX NetBackup servers. Media Manager is part of NetBackup.

◆ *NetBackup Troubleshooting Guide - UNIX*

Provides troubleshooting information for UNIX-based NetBackup products. You can also refer to `www.support.veritas.com`, access the Knowledge Base Search option, and search for TechNotes.

If you have a Windows server, refer to these documents:

◆ *NetBackup System Administrator's Guide for Windows*

Explains how to configure and manage NetBackup on a Windows server system.

◆ *NetBackup Media Manager System Administrator's Guide for Windows*

Explains how to configure and manage the storage devices and media on Windows NetBackup servers. Media Manager is part of NetBackup.

◆ *NetBackup Troubleshooting Guide for Windows*

Provides troubleshooting information for Windows-based NetBackup products. You can also refer to `www.support.veritas.com`, access the Knowledge Base Search option, and search for TechNotes.

For this product, you may also need the following manuals from Oracle Corporation:

◆ *Oracle Enterprise Backup Utility Installation and Configuration Guide*

For this product, you may also need the following manuals from SAP Corporation:

◆ *BC SAP Database Administration: Oracle*

You may also need the following manual from SAP AG:

◆ *BC-BRI BACKINT Interface R/3 System*, Release 3.x and 4.x

Conventions

The following explains typographical and other conventions used in this guide.

Type Style

Typographic Conventions

Typeface	Usage
Bold fixed width	Input. For example, type **cd** to change directories.
Fixed width	Paths, commands, filenames, or output. For example: The default installation directory is /opt/VRTSxx.

Typographic Conventions (continued)

Typeface	Usage
Italics	Book titles, new terms, or used for emphasis. For example: *Do not* ignore cautions.
Sans serif (italics)	Placeholder text or variables. For example: Replace *filename* with the name of your file.
Serif (no italics)	Graphical user interface (GUI) objects, such as fields, menu choices, etc.
	For example: Enter your password in the **Password** field.

Notes and Cautions

Note This is a Note. Notes are used to call attention to information that makes using the product easier or helps in avoiding problems.

Caution This is a Caution. Cautions are used to warn about situations that could cause data loss.

Key Combinations

Some keyboard command sequences use two or more keys at the same time. For example, holding down the **Ctrl** key while pressing another key. Keyboard command sequences are indicated by connecting the keys with a plus sign. For example:

Press Ctrl+t

Command Usage

The following conventions are frequently used in the synopsis of command usage.

brackets [ ]

The enclosed command line component is optional.

Vertical bar or pipe (|)

Separates optional arguments from which the user can choose. For example, when a command has the following format:

`command` *arg1* | *arg2*

the user can use either the *arg1* or *arg2* variable.

Terms

The terms listed in the table below are used in the VERITAS NetBackup documentation to increase readability while maintaining technical accuracy.

Term	Definition
Microsoft Windows, Windows	Terms used as nouns to describe a line of operating systems developed by Microsoft, Inc.
	A term used as an adjective to describe a specific product or noun. Some examples are: Windows 95, Windows 98, Windows NT, Windows 2000, Windows servers, Windows clients, Windows platforms, Windows hosts, and Windows GUI.
	Where a specific Windows product is identified, then only that particular product is valid with regards to the instance in which it is being used.
	For more information on the Windows operating systems that NetBackup supports, refer to the VERITAS support web site at `http://www.support.veritas.com`.
Windows servers	A term that defines the Windows server platforms that NetBackup supports; those platforms are: Windows NT and Windows 2000.
Windows clients	A term that defines the Windows client platforms that NetBackup supports; those platforms are: Windows 95, 98, ME, NT, 2000, XP (for 32- and 64-bit versions), and LE.

Getting Help

For updated information about this product, including system requirements, supported platforms, supported peripherals, and a list of current patches available from Technical Support, visit our web site:

```
http://www.support.veritas.com/
```

VERITAS Customer Support has an extensive technical support structure that enables you to contact technical support teams that are trained to answer questions to specific products. You can contact Customer Support by sending an e-mail to support@veritas.com, or by finding a product-specific phone number from the VERITAS support web site. The following steps describe how to locate the proper phone number.

1. Open `http://www.support.veritas.com/` in your web browser.

2. Click **Contact Support**. The *Contacting Support Product List* page appears.

3. Select a product line and then a product from the lists that appear. The page will refresh with a list of technical support phone numbers that are specific to the product you just selected.

Introduction 1

NetBackup for SAP on Windows integrates the database backup and recovery capabilities of SAP Tools with the backup and recovery management capabilities of NetBackup and its Media Manager.

This chapter introduces NetBackup for SAP on Windows and how it relates to both SAP Tools and NetBackup. The following topics introduce NetBackup for SAP on Windows.

◆ Terminology for NetBackup for SAP on Windows

◆ Features of NetBackup for SAP on Windows

◆ Technical Overview of NetBackup for SAP on Windows

◆ Changes between 3.4 and 4.5

Terminology for NetBackup for SAP on Windows

This section explains important terms that may be new to an SAP for Oracle database administrator or a NetBackup administrator. Refer to the following graphic when reviewing the terminology in this section.
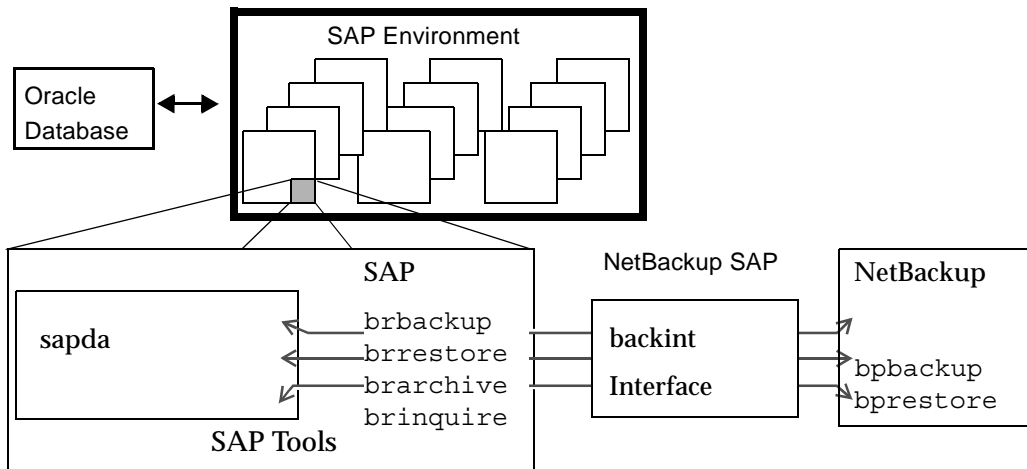
NetBackup

This section describes NetBackup terms as they apply to NetBackup for SAP on Windows.

NetBackup	NetBackup backs up and restores files, directories, raw partitions, and databases on client systems that have SAP databases.
NetBackup policy	NetBackup policies define criteria for backups and restores. These criteria include storage unit and media to use, backup schedules, clients, files to back up, or backup templates or scripts to execute.
NetBackup schedule	NetBackup schedules control NetBackup operations such as: when backups can occur, the type of backup (full, incremental) to perform, and how long NetBackup retains the image (retention level).
Administrator directed backups	NetBackup administrators are able to perform remote backups of all files, directories, databases, and raw partitions contained on client systems within a client/server network via NetBackup interfaces.
User-directed backups and restores	NetBackup users are able to perform backups of all files, directories, databases, and raw partitions contained on client systems within a client system.
Graphical interfaces	Graphical user interfaces are available for both users and administrators.
Media Manager	The Media Manager provides complete management and tracking of all devices and media used during backups and restores.

SAP Tools

The SAP Environment consists of many modules and applications. One small piece of the SAP Environment is the SAP Tools. SAP Tools provide:

◆ backup and recovery function for an Oracle database,

◆ Oracle administration by communicating with NetBackup through NetBackup for SAP on Windows.

sapdba	sapdba is a menu-driven utility, with menus designed to reflect the user's point of view. sapdba provides easy access to brbackup, brarchive, brrestore for database backup/restore. The tool can restore a backup of an entire database or reset the database to a previous state.
brbackup	This command brings database servers on-line or off-line, checks the status of SAP files, and places database tablespaces into BACKUP mode to guarantee their data consistency. brbackup provides on-line or off-line backup of control files, data files, and on-line redo log files. It also keeps a profile and log of each backup. brbackup uses the NetBackup software, through NetBackup for SAP on Windows, for: ◆ SAP datafile backups ◆ datafile and on-line log backups ◆ error handling
brarchive	This command archives Oracle off-line redo log files by communicating with the NetBackup for SAP on Windows backint interface. These files are copied by Oracle in its archiving directory. brarchive ensures that duplicates of these logs are available and that original files are not deleted prematurely. This command also keeps a profile and log of each archive.
brrestore	This command recovers database data files, control files, and on-line redo log files through the NetBackup for SAP on Windows backint interface. brrestore ensures that sufficient space is available prior to restoring these files, and removes files that will be overwritten during the recovery. This command also provides a query mode.
SAP script	This is a small script that contains SAP commands such as brbackup and brrestore.
backint Interface	The NetBackup for SAP on Windows backint interface communicates instructions from SAP Tools to NetBackup. The backint interface is the implementation of the SAP system's *BC-BRI BACKINT Interface* specification.

Backup Function　The backup function of the `backint` interface supports and defines the SAP `brbackup` and `brarchive` tools to NetBackup. `brbackup/brarchive` communicate with the `backint` interface through an *in_file* and an *out_file* parameter. The *in_file* parameter includes a list of files to be backed up or archived. The *out_file* parameter reports the status for each file and assigns a Backup ID (BID) to each file. In the event of a partial backup, this function will identify successfully backed up files to the user.

Restore Function　The restore function of the `backint` interface supports and defines the `brrestore` tool to NetBackup. It communicates with the `backint` interface through the *in_file* parameter and *out_file* parameter. The *in_file* parameter includes a list of files to be restored through NetBackup. It also includes the Backup ID (BID) assigned during the backup function. The *out_file* parameter contains the status of the restore for each file. When the NetBackup restore operation is complete, the restore function lists successfully restored files. It will also list BIDs used during the operation.

The BID is assigned by NetBackup during the backup function. It may identify one or more backup runs, a single file backup or a group of files. During a backup function, the BID is submitted to the *out_file* parameter. During the restore and inquiry functions, the BID can only be set in the *in_file* parameter. For more details, refer to "backint Command Line" on page 75.

If the BID is not set, the restore function will use the BID of the last backup. As an option, this function can also include a list of directories into which files will be restored. For more details, refer to "backint -i in_file Contents" on page 77.

Inquiry Function　The inquire function supports and defines the `sapdba` tool to NetBackup. `sapdba` uses the *in_file* parameter and the *out_file* parameter to collect backup information. The *in_file* parameter contains optional BIDs and filenames.

If only a #NULL is received on the *in_file* parameter, a list of BIDs will be generated to the *out_file* parameter. If a BID is received, a list of files belonging to the BID is generated. If a filename is entered along with the #NULL, a list of BIDs containing that file will be listed.

Features of NetBackup for SAP on Windows

This section describes the NetBackup for SAP on Windows main features.

Feature	Description
Media and device management	All devices supported by Media Manager are available to NetBackup for SAP on Windows.
Scheduling facilities	NetBackup scheduling facilities on the master server can be used to schedule automatic and unattended SAP backups.
	This also lets you choose the times when these operations can occur. For example, to prevent interference with normal daytime operations, you can schedule your database backups to occur only at night.
Multiplexed backups and restores	NetBackup for SAP on Windows lets you take advantage of NetBackup's multiplexing capabilities. Multiplexing directs multiple data streams to one backup device, thereby reducing the time necessary to complete the operation.
Transparent execution of both SAP and regular file system backup and restore operations	All backups and restores are executed simultaneously and transparently without any action from the NetBackup administrator.
	A database administrator can execute database backup and restore operations through NetBackup or use SAP Tools as if NetBackup were not present.
	An administrator or any other authorized user can use NetBackup to execute database backups and restores.
Sharing the same devices and tapes used during other file backups	It is possible to share the same devices and media used for other backups or to give SAP exclusive use of certain devices and media.
Centralized and networked backup operations	From the NetBackup master server, you can schedule database backups or start them manually for any client. The SAP databases can also reside on hosts that are different from the devices on which NetBackup stores the backups.

Feature	Description
Graphical user interfaces	NetBackup provides the following graphical user interfaces for client users and administrators: ◆ Backup, Archive, and Restore user interface ◆ Client user interface on Windows 95/98/2000 and NT clients ◆ NetBackup Administration Console for Java ◆ NetBackup Administration Console for Windows A database administrator or NetBackup administrator can start backup or restoreoperations for SAP from the NetBackup graphical user interface on the master server.
Parallel backup and restore operations	NetBackup for SAP on Windows supports the parallel backup and restore capabilities of the SAP Tools. This permits the user to run more than one tape device at a time for a single SAP backup or restore, thereby reducing the time necessary to complete the operation.

Technical Overview of NetBackup for SAP on Windows

The following figure illustrates the components and architecture for SAP and NetBackup.

SAP Applications

Oracle
Database

`brbackup`	`brarchive`	`brrestore`	`sapda`

DB Agent
Operation
Interface

`backint`	`backint`	`backint`	`backint`

Database/File
Backup/Restore

NetBackup for SAP

Robots/Media
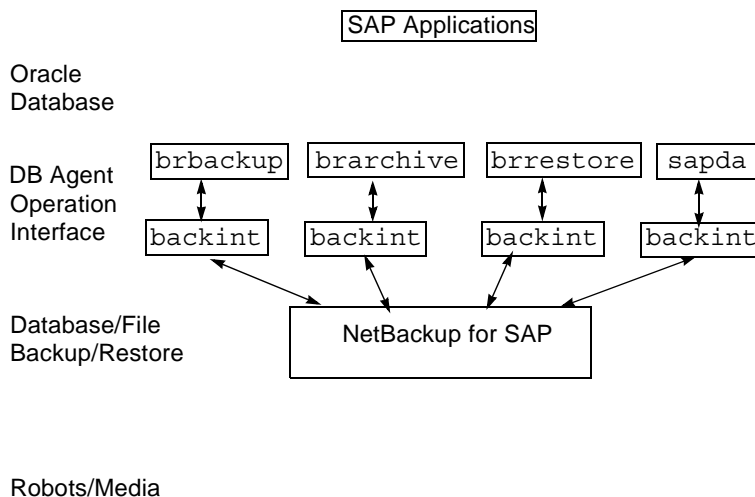
SAP Tools act as database agents, responsible for all database related tasks. These database agents (`brbackup`, `brarchive`, and `brrestore`) communicate with NetBackup through the NetBackup for SAP on Windows `backint` interface. The `sapdba` component of SAP Tools also accesses the backup catalog used by NetBackup in order to determine the status of the valid backups.

The example network below shows the major components in a NetBackup for SAP on Windows `backint` interface configuration.
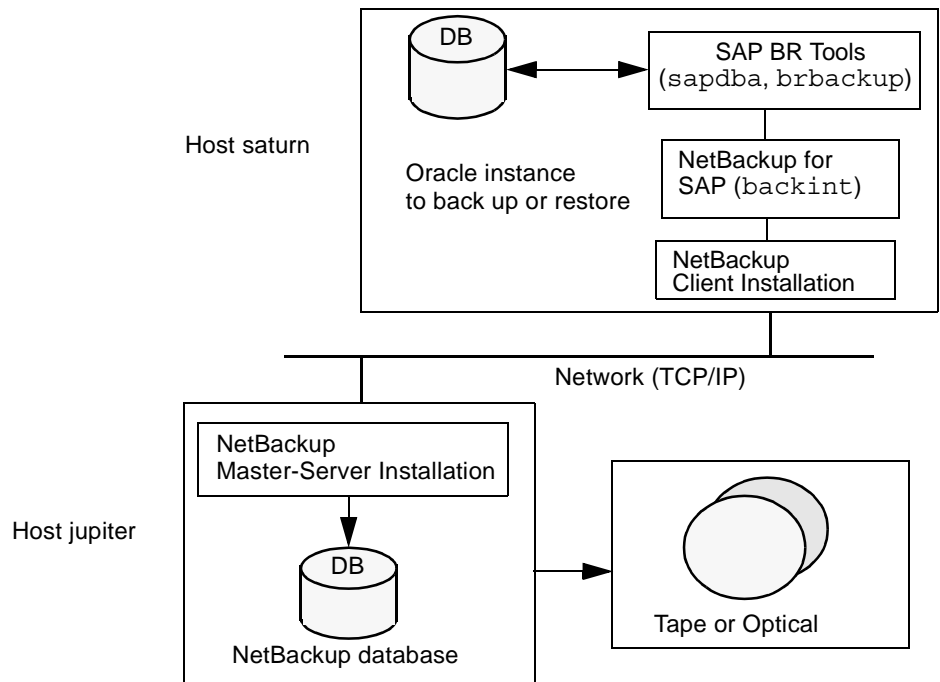
The host with the database must be a NetBackup client and have NetBackup for SAP on Windows, SAP software, and Oracle software installed.

The storage devices are connected to the NetBackup master server. A NetBackup media server can access the storage devices through the master server. Both the master server and the media server must have NetBackup server software installed.

Using NetBackup requires that the administrator create an SAP script with commands for controlling database backup or recovery. For example, an SAP script to back up Oracle databases would have a `brbackup` command. A separate SAP script is needed for each type of operation (see "Creating Scripts" on page 46 for more information on these SAP scripts).

Sequence of Operation

NetBackup users or schedules start database backups or restores by selecting an SAP script. A NetBackup process called bphdb starts the SAP script on the client. The SAP application then starts the requested operation on the databases.
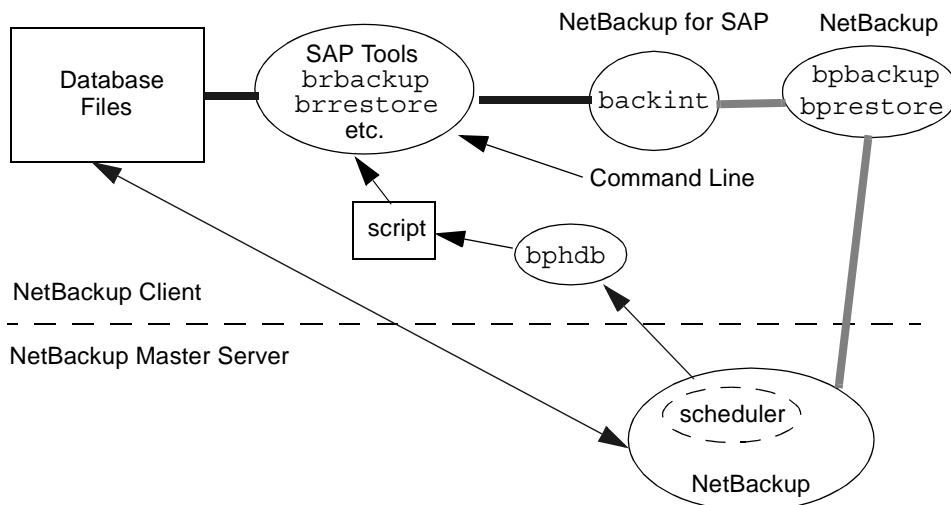
For a backup, brbackup calls the NetBackup for SAP on Windows backint interface. From this point the operation is similar to a user-directed backup.

A restore works in essentially the same manner except that the NetBackup for SAP on Windows backint interface issues a bprestore command, causing NetBackup to retrieve the data from secondary storage and send it to the client.

Changes Between 3.4 and 4.5

The following are the changes that occurred between release 3.4 and 4.5.

Eliminate multiple jobs for online backup

Currently Online mode creates a backup job for every data file in the Oracle database. This creates too much volume for the master server and is prone to causing socket or I/O errors. It also creates an unmanageable number of jobs for the display of the job monitor. The UNIX `backint` has been changed so that it only submits backup jobs specified by the `drives` parameter in the .utl file. For example, if the number of drives is set to 5, only 5 `bpbackup` jobs will be executed.

SAP agent enhanced dual stream capability

NetBackup for SAP 3.4 currently supports sending dual streams of archived log data to NetBackup. However, it sends only one stream of control files. This can lead to situation where one media contains a copy of archive files and control files, while the other media contains a copy of just archive files. NetBackup for SAP 4.5 extends this feature and supports sending dual streams of control files to NetBackup. You can use this feature of NetBackup for SAP 4.5 by setting `second_secondary_archive` in the init<SID>.utl file, described in "Configuring the initSID.utl File" on page 50.

Verbose logging values adjusted

NetBackup 4.5, in accordance with the other NetBackup products, now supports Verbose logging levels of 1 through 5. We recommend using level 1 for general use. Use higher levels only for debugging.

Installation 2

This chapter explains how to install NetBackup for SAP on Windows.

To determine which SAP version levels are supported, refer to the Database Agent Matrix in the *NetBackup Release Notes.*

Installation Prerequisites

Before installing NetBackup for SAP on Windows, be sure you have completed the following procedures:

❖ Install the NetBackup server software on the server.

The NetBackup server platform can be any of those that NetBackup supports.

For a BusinesServer installation, refer to the *NetBackup BusinesServer Getting Started Guide for UNIX* or the *NetBackup BusinesServer Getting Started Guide for Windows* for details.

For a DataCenter installation, refer to the *NetBackup DataCenter Installation Guide for UNIX* or the *NetBackup DataCenter Installation Guide for Windows*.

backing upNow you are ready to install NetBackup for SAP on Windows on the client where you will be backing up the databases. Refer to the next section for detailed instructions on installing NetBackup for SAP on Windows.

Installing NetBackup for SAP on Windows

The following is the procedure for installing NetBackup for SAP on Windows.

Installation Requirements

◆ A valid license key for NetBackup for SAP on Windows must be registered on the master or media server. License keys can be added from the NetBackup Administration Console. From the **Help** menu, choose **License Keys**.

◆ The version of the NetBackup Client and the version of NetBackup for SAP on Windows must be the same (e.g., 4.5).

▼ **To install NetBackup for SAP on Windows:**

1. Insert the NetBackup CD-ROM into the drive.

   - On systems with AutoPlay enabled for CD-ROM drives, the NetBackup install program starts automatically.

   - On Windows NT 4.0 or Windows 2000 systems that have AutoPlay disabled, run the `Launch.exe` program in the root directory on the CD-ROM.

2. Below the "Main Menu" on the left, click **Database Agents**.

3. Click **Database Agent Installation**.

4. Click **SAP**.

5. Click **Next** and follow the prompts in the setup program.

Configuration 3

Before attempting to configure NetBackup for SAP on Windows, complete the installation procedure as described in the Installation chapter.

The following is the configuration procedure.

1. Copying NetBackup for SAP on Windows Binary

2. Configuring the Media Manager

3. Setting the Maximum Jobs per Client Global Attribute

4. Configuring a NetBackup Policy

5. Creating Scripts

6. Enabling Database User Authentication

7. Configuring the initSID.utl File

8. Configuring the initSID.sap File

9. Testing NetBackup for SAP on Windows Configuration Settings

To configure NetBackup for SAP on Windows from a Windows NetBackup server, see "Configuration Using the NetBackup Administration Console for Windows" on page 19.

To configure NetBackup for SAP on Windows from a UNIX NetBackup server, see "Configuration Using the NetBackup Administration Console for UNIX" on page 32.

Copying NetBackup for SAP on Windows Binary

SAP requires that all SAP Tools be located in a predetermined folder. The folder path is as follows:

```
C:\usr\sap\SID\SYS\exe\run
```

where *SID* is a unique name for an Oracle database instance. *SID* is also known as System ID.

The folder should contain the following commands:

◆ `brarchive.exe`

◆ `brbackup.exe`

◆ `brconnect.exe`

◆ `brrestore.exe`

◆ `brtools.exe`

◆ `sapdba.exe`

So, to follow SAP convention we need to copy `backint.exe` from the NetBackup install folder to SAP's tool folder. For example, if the Oracle instance name is CER, then the following command needs to be executed:

```
copy install_path\NetBackup\bin\backint.exe
c:\usr\sap\CER\sys\exe\run
```

Configuration Using the NetBackup Administration Console for Windows

Although the database agent is installed on the NetBackup client, some configuration procedures are performed using the NetBackup Administration Console on the server.

These procedures include:

◆ Configuring the Media Manager

◆ Setting the Maximum Jobs per Client global attribute

◆ Configuring a NetBackup policy

◆ Testing NetBackup for SAP on Windows configuration settings

See the next section for instructions on starting the NetBackup Administration Console.

▼ **To launch the NetBackup Administration Console for Windows**

1. Log on to the server as administrator.

2. From the Windows **Start** menu, point to **Programs**, point to **VERITAS NetBackup** and click **NetBackup Administration Console**.

The NetBackup Administration Console appears.

Configuring the Media Manager

Use the Media Manager to configure tapes or other storage units for a NetBackup for SAP on Windows configuration.

◆ Refer to the *Media Manager for NetBackup System Administrator's Guide for UNIX* if the NetBackup server is UNIX.

◆ Refer to the *Media Manager for NetBackup System Administrator's Guide for Windows* if the NetBackup server is Windows.

The number of volumes required will depend on the devices used, the size of the SAP databases that you are backing up, and the frequency of backups.

Setting the Maximum Jobs per Client Global Attribute

The **Maximum jobs per client** attribute value is figured with the following formula.

`Max Jobs per Client =` *Number of Drives* x *Number of Policies*

Where:

◆ *Number of Drives* is the number of concurrent `bpbackup` jobs. These jobs are defined by the drive parameter in the init*SID*.`utl` file.

◆ *Number of Policies* is the number of policies that may back up this client at the same time. This number can be greater than one. For example, a client may be in two policies in order to back up two different databases. These backup windows may overlap.

▼ **To set the Maximum jobs per client attribute on a Windows server**

1. In the left pane of the NetBackup Administration Console, expand **Host Properties**. Select **Master Server**.

2. In the right pane, double-click on the server icon.

   The Master Server Properties dialog box appears.

3. In the Master Server Properties dialog box, click the **Global NetBackup Attributes** tab.
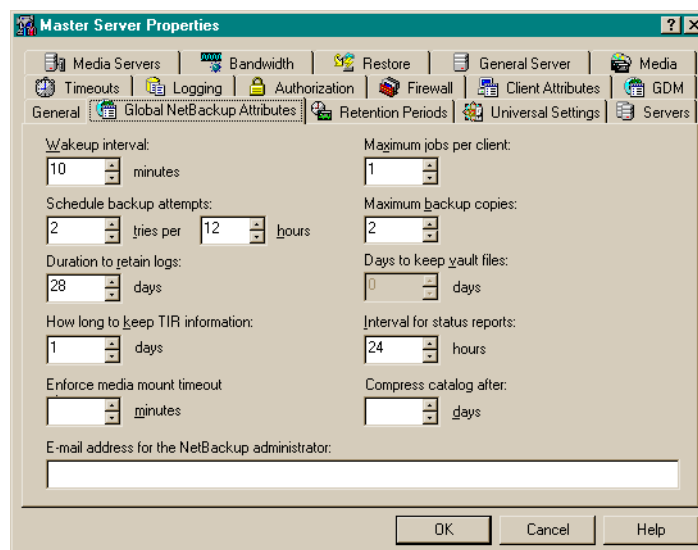
   The default value is 1 for **Maximum jobs per client**.

4. Change the **Maximum jobs per client** value to a value equal to the maximum number of backups allowed per client.

   Tip   To avoid any problems, we recommend that you enter a value of 99 for the **Maximum jobs per client** global attribute.

Configuring a NetBackup Policy

A NetBackup policy defines the backup criteria for a specific group of one or more clients. These criteria include:

◆ storage unit and media to use

◆ backup schedules

◆ script files to be executed on the clients

◆ clients to be backed up

To use NetBackup for SAP on Windows, at least one SAP policy with the appropriate schedules needs to be defined. A configuration can have a single policy that includes all clients or there can be many policies, some of which include only one client.

Most requirements for SAP policies are the same as for file system backups. In addition to the attributes described here, there are other attributes for a policy to consider. Refer to the *NetBackup System Administrator's Guide* for detailed configuration instructions and information on all the attributes available.

Adding New Policies

Use this procedure when configuring a policy from a Windows server or from a NetBackup Remote Administration Console host.

▼ **To add a new policy**

Note This policy name can be specified in the init*SID*.utl file on the client.

1. Log on to the server as administrator.

2. Start the NetBackup Administration Console.

3. If your site has more than one master server, choose the one where you want to add the policy.

4. In the left pane, right-click **Policies**. From the menu, select **New Policy**.

The Add a New Policy dialog box appears.
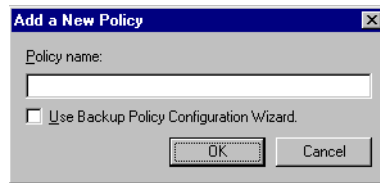
Add a New Policy

Policy name:

☐ Use Backup Policy Configuration Wizard.

OK   Cancel

a. In the **Policy name** box, type a unique name for the new policy.

b. Choose whether to use the wizard for configuring the policy. The wizard guides you through the setup process and simplifies it by automatically choosing default values that are good for most configurations. If necessary, you can change the defaults later by editing the policy.

- To use the wizard, select the **Use Backup Policy Configuration Wizard** box and click **OK**. The wizard starts and you create the policy by following the prompts. When prompted, select the SAP policy type.

- If you require more control over the settings than the wizard provides, then do not select the **Use Backup Policy Configuration Wizard** box and proceed to step 5.

5. Click **OK**.

A dialog box appears in which you can specify the general attributes for the policy.
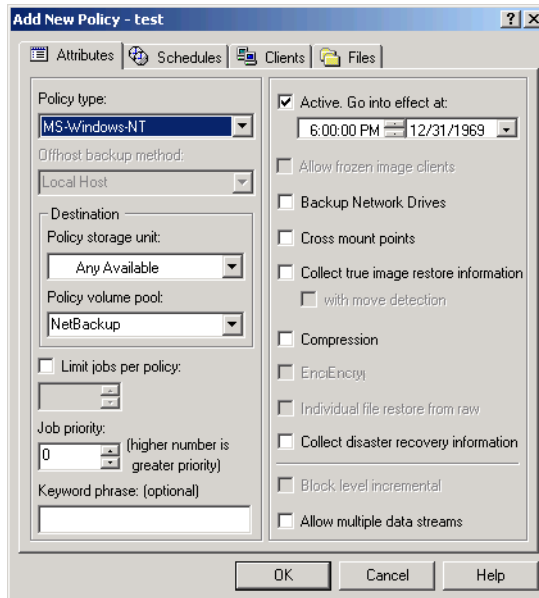
6. From the **Policy Type** box, select the SAP policy type.

7. Complete the entries on the **Attributes** tab as explained in "Description of Attributes."

8. Add other policy information:
   - To add schedules, see "Adding New Schedules."
   - To add scripts, see "Specifying the List of Scripts."
   - To add clients, see "Adding Clients to a Policy."

9. Click **OK**. The new policy will be created.

Description of Attributes

With a few exceptions, NetBackup manages a database backup like a file system backup. Policy attributes that are different for SAP backups are explained below.

Your other policy attributes will vary according to your specific backup strategy and system configuration. Consult the *NetBackup System Administrator's Guide* for detailed explanations of the policy attributes.

Description of Policy Attributes

Attribute	Description
Policy type	Determines the type of clients that can be in the policy and in some cases the types of backups that can be performed on those clients. To use NetBackup for SAP on Windows, you must have defined at least one SAP policy.
Keyword phrase	For NetBackup for SAP on Windows, the keyword phrase entry is ignored.

Adding New Schedules

Each policy has its own set of schedules. These schedules control initiation of automatic backups and also specify when user operations can be initiated.

A server-directed, scheduled SAP backup requires at least two specific schedule types: an Application Backup schedule and an Automatic Backup schedule. You can also create additional schedules.

The following procedures explain how to configure the required schedule types, and how to add other new schedules.

▼ **To configure an Application Backup schedule**

    1. Double-click on the schedule named **Default**-**Application**-**Backup**.

       All SAP database operations are performed through NetBackup for SAP on Windows using an Application Backup schedule. This includes those backups started automatically.

       You must configure an Application Backup schedule for each SAP policy you create. If you do not do this, you will not be able to perform a backup. To help satisfy this requirement, an Application Backup schedule named **Default**-**Application**-**Backup** is automatically created when you configure a new SAP policy.

    2. Specify the other properties for the schedule as explained in "Schedule Properties."

       The backup window for an Application Backup schedule must encompass the time period during which all NetBackup jobs, scheduled and unscheduled, will occur. This is necessary because the Application Backup schedule starts processes that are required for all NetBackup for SAP on Windows backups, including those started automatically.

For example, assume that you:

- expect users to perform NetBackup operations during business hours, 0800 to 1300.

- configured automatic backups to start between 1800 and 2200.

The Application Backup schedule must have a start time of 0800 and a duration of 14 hours.

Example Settings for an Application Backup schedule.

Type of Backup	Schedule settings	Description	Settings
Application Backup	Retention	The length of time backup images are stored.	2 weeks
	Backup Window	The time during which a NetBackup operation can be performed.	Sunday through Saturday 00:00:01 - 23:59:59

Note The Application Backup schedule name can be specified in the init*SID*.utl file on the client.

Tip Set the time period for the Application Backup schedule for 24 hours per day, seven days per week. This will ensure that your NetBackup for SAP on Windows operations are never locked out due to the Application Backup schedule.

▼ **To configure an automatic backup schedule**

1. In the left pane, right-click on the name of the policy and select **New Schedule** from the menu.

   The Add New Schedule dialog box appears. The title bar shows the name of the policy to which you are adding the schedules.
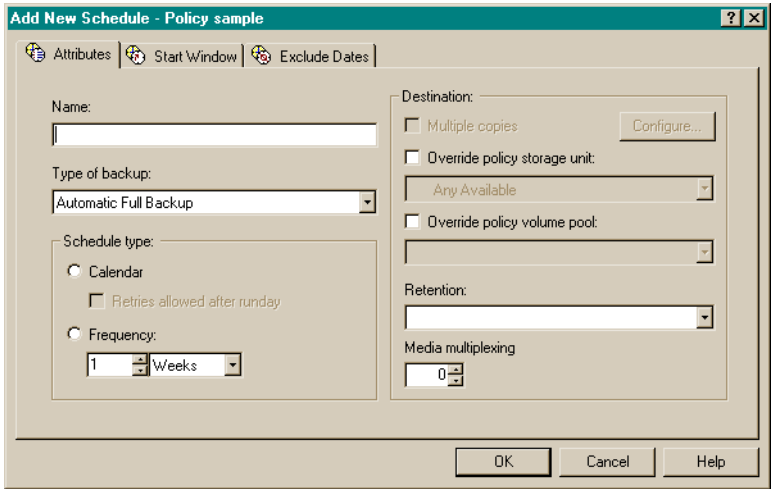
2. Specify a unique name for the schedule.

3. Select the **Type of Backup**.

   For information on the types of backups available for this policy, see "Types of Backups."

   Refer to the following table for recommended settings for an Automatic Backup schedule.

Example Settings for an Automatic Backup Schedule.

Type of Backup	Schedule settings	Description	Settings
Automatic Backup	Retention	The length of time to store the record of a backup.	2 weeks
	Frequency	Frequency determines how often a backup should be performed	every week
	Backup Window	The time during which a NetBackup operation can be performed.	Sunday, 18:00:00 - 22:00:00

4. Specify the other properties for the schedule as explained in "Schedule Properties."

Types of Backups

Description of Backup Types for SAP

Application Backup	The Application Backup schedule enables user-controlled NetBackup operations performed on the client. At least one Application Backup schedule type must be configured for each SAP policy. The Default-Application-Backup schedule is automatically configured as an Application Backup schedule.
Automatic Backup	An Automatic Backup schedule specifies the dates and times when NetBackup will automatically start backups by running the SAP scripts in the order that they appear in the file list. If there is more than one client in the SAP policy, the SAP scripts are executed on each client.

Schedule Properties

Some of the schedule properties have a different meaning for database backups than for a regular file system backup. These properties are explained below.

Other schedule properties will vary according to your specific backup strategy and system configuration. Consult the *NetBackup System Administrator's Guide* for detailed explanations of the schedule properties.

Description of Schedule Properties

Property	Description
Type of backup	Specifies the type of backup that this schedule will control. The selection list shows only the backup types that apply to the policy you are configuring. For more information see "Types of Backups."
Frequency	This setting is used only for scheduled backups, and not for user-directed backups. **Frequency** specifies the period of time that will elapse until the next backup operation can begin on this schedule. For example, if the frequency is seven days and a successful backup occurs on Wednesday, the next full backup will not occur until the following Wednesday. Normally, incremental backups will have a shorter frequency than full backups.
Calendar	This setting is used only for scheduled backups, and not for user-directed backups. The **Calendar** option allows you to schedule backup operations based on specific dates, recurring week days, or recurring days of the month.

Description of Schedule Properties

Property	Description
Retention	**Frequency based scheduling**
	The retention period for an Application Backup schedule refers to the length of time that NetBackup keeps backup images.
	The retention period for an Automatic Backup schedule controls how long NetBackup keeps records of when scheduled backups have occurred.
	The NetBackup scheduler compares the latest record to the frequency to determine whether a backup is due. This means that if you set the retention period to expire the record too early, the scheduled backup frequency will be unpredictable. However, if you set the retention period to be longer than necessary, the NetBackup catalog will accumulate unnecessary records. *Therefore, set a retention period that is <u>longer</u> than the frequency setting for the schedule.*
	For example, if the frequency setting is set to one week, set the retention period to be more than one week.
	Calendar based scheduling
	The retention period for an Application Backup schedule refers to the length of time that NetBackup keeps backup images.
	The retention period for an Automatic Backup schedule controls how long NetBackup keeps records of when scheduled backups have occurred. However, this setting is not significant for calendar based scheduling.
Multiple copies	If you are licensed for the Inline Tape Copy feature and wish to specify multiple copies for your SAP policy, configure **Multiple copies** on the Application Backup schedule.

Specifying the List of Scripts

The Scripts list in a database policy has a different meaning than the File list has for other policies. Normally, in a Windows-NT policy, you would list files and folders to be backed up. But since you are now configuring a database policy, you will list scripts.

Add scripts only if you are setting up a policy for automatic scheduling. All scripts listed in the Scripts list will be executed for the Automatic Backup schedules as specified under the **Schedules** tab.

All scripts specified in the Scripts list are executed during manual or automatic backups. NetBackup will start backups by running the scripts in the order that they appear in the Scripts list.

▼ **To add scripts to the Scripts List**

    1. In the left pane of the NetBackup Administration Console, right-click on the policy name and click **New Script**.

        A dialog box appears. The title bar shows the name of the policy to which you are adding the scripts.
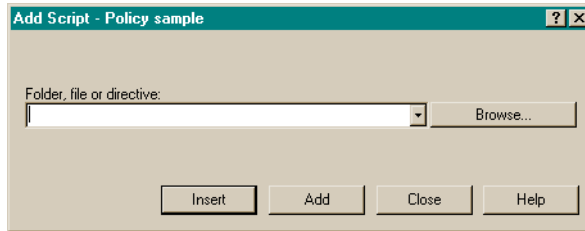
    2. Type the name of the NetBackup for SAP script.

        Be sure to specify the full pathname when listing SAP scripts. For example:

        install_path\NetBackup\dbext\sap\scripts\

        Be sure that the SAP scripts listed here are installed on each host in the Client list.

    3. Click **Add**.

Adding Clients to a Policy

The client list is the list of hosts on which your SAP scripts will be executed during an automatic backup. A NetBackup client must be in at least one policy but can be in more than one.

▼ **To add clients to a policy**

1. In the left pane of the NetBackup Administration Console, right-click on the policy name and click **New Client**.

The Add New Client dialog box appears. The title bar shows the name of the policy to which you are adding the clients.
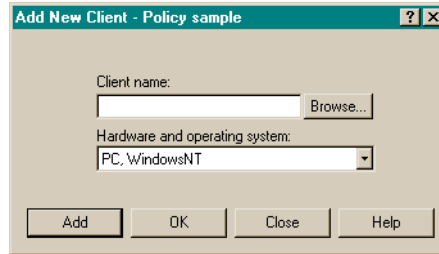
2. In the **Client name** text box, type the name of the client that you are adding.

On the client the following should be installed:

- SAP

- NetBackup client or server

- NetBackup for SAP on Windows

- the backup or restore script(s)

3. Choose the hardware and operating system type.

4. Click **Add**.

5. To add another client, repeat step 2 through step 4. If this is the last client, click **Close** to close the dialog box.

Configuration Using the NetBackup Administration Console for UNIX

Although the database agent is installed on the NetBackup client, some configuration procedures are performed using the NetBackup Administration Console on the server.

These procedures include:

◆ Configuring the Media Manager

◆ Setting the Maximum Jobs per Client global attribute

◆ Configuring a NetBackup policy

◆ Testing NetBackup for SAP on Windows configuration settings

See the next section for instructions on starting the NetBackup Administration Console.

▼ **To launch the NetBackup Administration Console for UNIX**

1. Log onto the UNIX server as root.

2. Start the NetBackup Administration Console by executing:

install_path/**netbackup/bin/jnbSA &**

The Login dialog box appears.
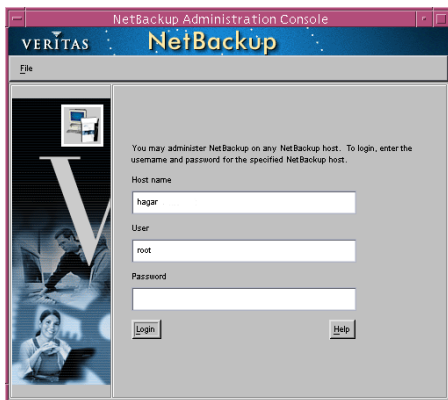
3. Type the name of the master server where you initially want to manage NetBackup. You can specify any NetBackup master server. Indicate the User and Password.

4. Click **Login**. The NetBackup Administration Console appears.

Configuring the Media Manager

Use the Media Manager to configure tapes or other storage units for a NetBackup for SAP on Windows configuration.

◆ Refer to the *Media Manager for NetBackup System Administrator's Guide for UNIX* if the NetBackup server is UNIX.

◆ Refer to the *Media Manager for NetBackup System Administrator's Guide for Windows* if the NetBackup server is Windows.

The number of volumes required will depend on the devices used, the size of the SAP databases that you are backing up, and the frequency of backups.

Setting the Maximum Jobs per Client Global Attribute

The **Maximum jobs per client** attribute value is figured with the following formula.

```
Max Jobs per Client = Number of Drives x Number of Policies
```

Where:

◆ *Number of Drives* is the number of concurrent `bpbackup` jobs. These jobs are defined by the drive parameter in the init*SID*.utl file.

◆ *Number of Policies* is the number of policies that may back up this client at the same time. This number can be greater than one. For example, a client may be in two policies in order to back up two different databases. These backup windows may overlap.

▼ **To set the Maximum jobs per client attribute on a UNIX server**

Use this procedure to set the **Maximum jobs per client** global attribute using the NetBackup Administration Console - Java interface on a Java-capable platform.

1. In the left pane of the NetBackup Administration Console, expand **Host Properties**. Select **Master Servers**.

2. In the right pane, double-click on the server icon. Click **Global Attributes**.

   The Master Server Properties dialog box appears.
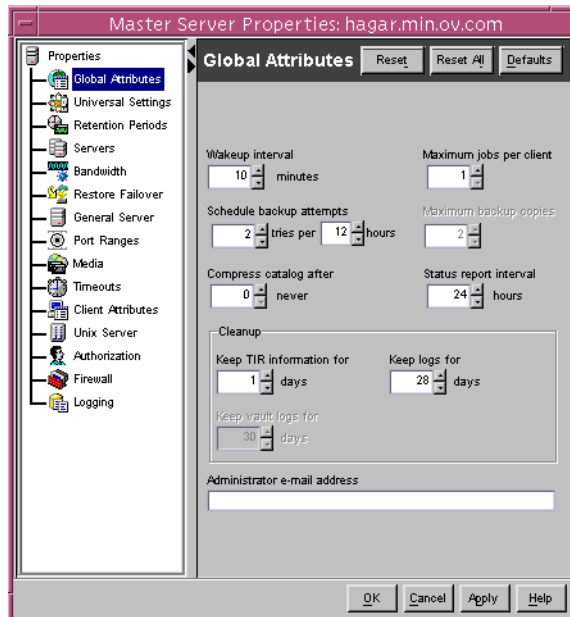
   The default value is 1 for **Maximum jobs per client**.

3. Change the **Maximum jobs per client** value to a value equal to the maximum number of backups allowed per client.

Tip To avoid any problems, we recommend that you enter a value of 99 for the **Maximum jobs per client** global attribute.

Configuring a NetBackup Policy

A NetBackup policy defines the backup criteria for a specific group of one or more clients. These criteria include:

◆ storage unit and media to use

◆ backup schedules

◆ script files to be executed on the clients

◆ clients to be backed up

To use NetBackup for SAP on Windows, at least one SAP policy with the appropriate schedules needs to be defined. A configuration can have a single policy that includes all clients or there can be many policies, some of which include only one client.

Most requirements for SAP policies are the same as for file system backups. In addition to the attributes described here, there are other attributes for a policy to consider. Refer to the *NetBackup System Administrator's Guide* for detailed configuration instructions and information on all the attributes available.

Use this procedure when configuring a policy from a UNIX server.

▼ **To add a new policy**

Note This policy name can be specified in the init*SID*.utl file on the client.

1. Log onto the server as root.

2. Start the NetBackup Administration Console.

3. If your site has more than one master server, choose the one to which you want to add the policy.

4. In the left pane, click on **Policies**. The right pane splits into a All Policies pane and a details pane.

5. In the All Policies pane, right-click on the Master Server, and click **New**.

The Add a New Policy dialog box appears.
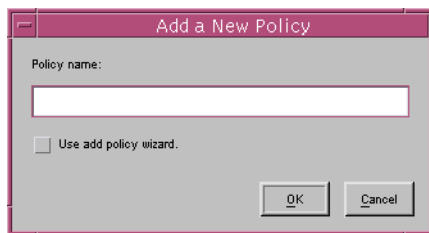
a. In the **Policy name** box, type a unique name for the new policy.

b. Choose whether to use the wizard for configuring the policy. The wizard guides you through the setup process and simplifies it by automatically choosing default values that are good for most configurations. If necessary, you can change the defaults later by editing the policy.

- To use the wizard, select the **Use add policy wizard** box and click **OK**. The wizard starts and you create the policy by following the prompts. When prompted, select the SAP policy type.

- If you require more control over the settings than the wizard provides, do not select the **Use add policy wizard box** and proceed to step 6.

6. Click **OK**.

A dialog box appears in which you can specify the general attributes for the policy.
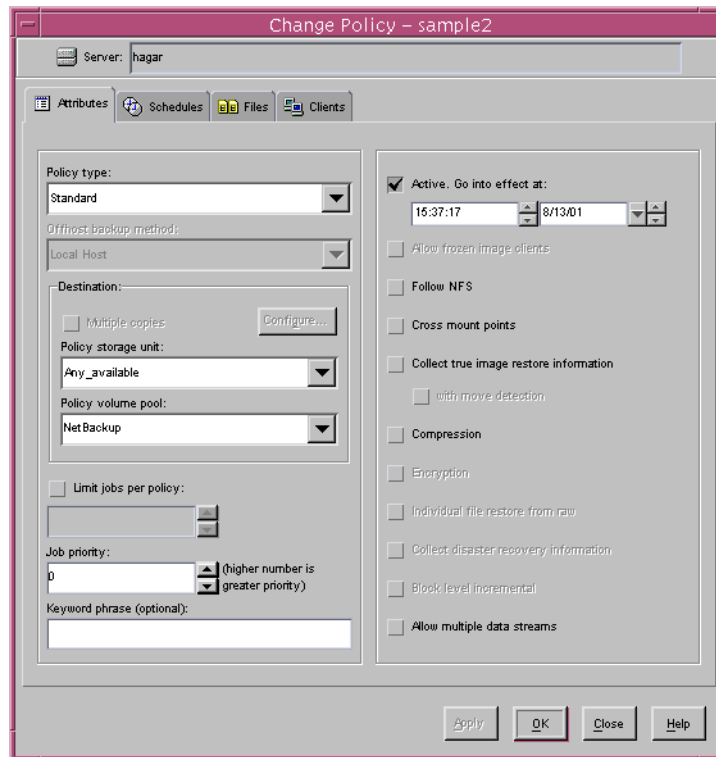
7. From the **Policy type** box, select the SAP policy type.

8. Complete the entries on the **Attributes** tab as explained in "Description of Attributes" and click **Apply** to save the attribute entries.

9. Add other policy information:

   - To add schedules, see "Adding New Schedules."

   - To add scripts, see "Specifying the List of Scripts."

   - To add clients, see "Adding Clients to a Policy."

Description of Attributes

With a few exceptions, NetBackup manages a database backup like a file system backup. Policy attributes that are different for SAP backups are explained below.

Your other policy attributes will vary according to your specific backup strategy and system configuration. Consult the *NetBackup System Administrator's Guide* for detailed explanations of the policy attributes.

Description of Policy Attributes

Attribute	Description
Policy type	Determines the type of clients that can be in the policy and in some cases the types of backups that can be performed on those clients. To use NetBackup for SAP on Windows, you must have defined at least one SAP policy.
Keyword phrase	For NetBackup for SAP on Windows, the keyword phrase entry is ignored.

Adding New Schedules

Each policy has its own set of schedules. These schedules control initiation of automatic backups and also specify when user operations can be initiated.

A server-directed, scheduled SAP backup requires at least two specific schedule types: an Application Backup schedule and an Automatic Backup schedule. You can also create additional schedules.

The following procedures explain how to configure the required schedule types, and how to add other new schedules.

▼ **To configure an Application Backup schedule**

1. Under the policy name, select **Schedules**.

2. In the right pane, double-click on the schedule named **Default-Application-Backup**.

    A dialog box appears. The title bar shows the name of the policy to which you are adding the schedule.

    All SAP database operations are performed through NetBackup for SAP on Windows using an Application Backup schedule. This includes those backups started automatically.

    You must configure an Application Backup schedule for each SAP policy you create. If you do not do this, you will not be able to perform a backup. To help satisfy this requirement, an Application Backup schedule named Default-Application-Backup is automatically created when you configure a new SAP policy.

3. Specify the other properties for the schedule as explained in "Schedule Properties."

The backup window for an Application Backup schedule must encompass the time period during which all NetBackup jobs, scheduled and unscheduled, will occur. This is necessary because the Application Backup schedule starts processes that are required for all NetBackup for SAP on Windows backups, including those started automatically.

For example, assume that you:

- expect users to perform NetBackup operations during business hours, 0800 to 1300.

- configured automatic backups to start between 1800 and 2200.

The Application Backup schedule must have a start time of 0800 and a duration of 14 hours.

Tip	Set the time period for the Application Backup schedule for 24 hours per day, seven days per week. This will ensure that your NetBackup for SAP on Windows operations are never locked out due to the Application Backup schedule.

Example Settings for an Application Backup schedule.

Type of Backup	Schedule settings	Description	Settings
Application Backup	Retention	The length of time backup images are stored.	2 weeks
	Backup Window	The time during which a NetBackup operation can be performed.	Sunday through Saturday 00:00:01 - 23:59:59

Note	The Application Backup schedule name can be specified in the init*SID*.utl file on the client.

▼ **To configure an automatic backup schedule**

    1. In the All Policies pane, expand the policy you wish to configure. Right-click **Schedules** and choose **New**.

        A dialog box appears. The title bar shows the name of the policy to which you are adding the schedules.
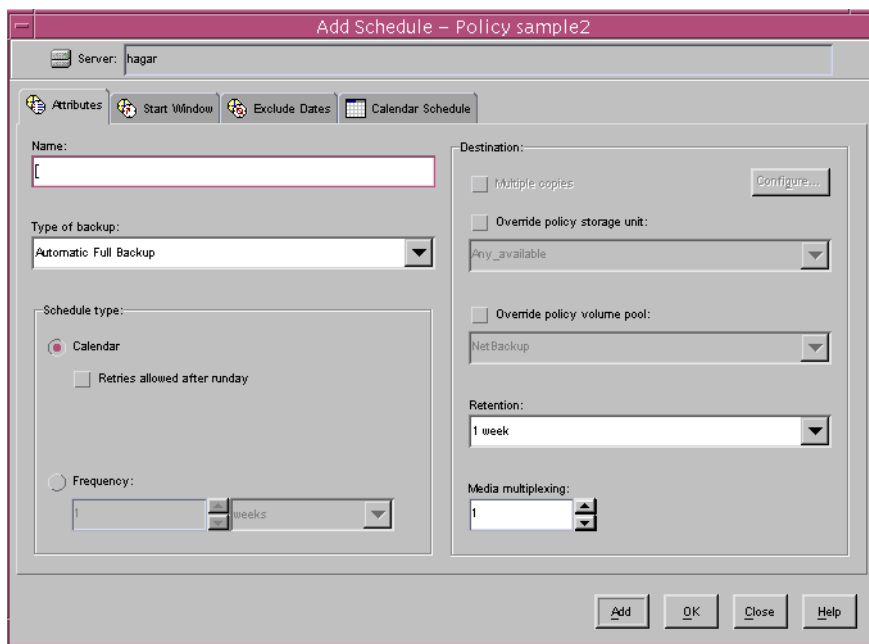
    2. Specify a unique name for the schedule.

    3. Select the **Type of Backup**.

        For information on the types of backups available for this policy, see "Types of Backups."

Refer to the following tables for recommended settings for an Automatic Backup schedule.

Example Settings for a Automatic Backup Schedule.

Type of Backup	Schedule settings	Description	Settings
Automatic Backup	Retention	The length of time to store the record of a backup.	2 weeks
	Frequency	Frequency determines how often a backup should be performed	every week
	Backup Window	The time during which a NetBackup operation can be performed.	Sunday, 18:00:00 - 22:00:00

4. Specify the other properties for the schedule as explained in "Schedule Properties."

Types of Backups

Description of Backup Types for SAP

Application Backup	The Application Backup schedule enables user-controlled NetBackup operations performed on the client. At least one Application Backup schedule type must be configured for each SAP policy. The Default-Application-Backup schedule is automatically configured as an Application Backup schedule.
Automatic Backup	An Automatic Backup schedule specifies the dates and times when NetBackup will automatically start backups by running the SAP scripts in the order that they appear in the file list. If there is more than one client in the SAP policy, the SAP scripts are executed on each client.

Schedule Properties

Some of the schedule properties have a different meaning for database backups than for a regular file system backup. These properties are explained below.

Other schedule properties will vary according to your specific backup strategy and system configuration. Consult the *NetBackup System Administrator's Guide* for detailed explanations of the schedule properties.

Description of Schedule Properties

Property	Description
Type of backup	Specifies the type of backup that this schedule will control. The selection list shows only the backup types that apply to the policy you are configuring.
	For more information see "Types of Backups."
Frequency	This setting is used only for scheduled backups, and not for user-directed backups. **Frequency** specifies the period of time that will elapse until the next backup operation can begin on this schedule. For example, if the frequency is seven days and a successful backup occurs on Wednesday, the next full backup will not occur until the following Wednesday. Normally, incremental backups will have a shorter frequency than full backups.
Calendar	This setting is used only for scheduled backups, and not for user-directed backups. The **Calendar** option allows you to schedule backup operations based on specific dates, recurring week days, or recurring days of the month.

Description of Schedule Properties

Property	Description
Retention	**Frequency based scheduling**
	The retention period for an Application Backup schedule refers to the length of time that NetBackup keeps backup images.
	The retention period for an Automatic Backup schedule controls how long NetBackup keeps records of when scheduled backups have occurred.
	The NetBackup scheduler compares the latest record to the frequency to determine whether a backup is due. This means that if you set the retention period to expire the record too early, the scheduled backup frequency will be unpredictable. However, if you set the retention period to be longer than necessary, the NetBackup catalog will accumulate unnecessary records. *Therefore, set a retention period that is <u>longer</u> than the frequency setting for the schedule.*
	For example, if the frequency setting is set to one week, set the retention period to be more than one week.
	Calendar based scheduling
	The retention period for an Application Backup schedule refers to the length of time that NetBackup keeps backup images.
	The retention period for an Automatic Backup schedule controls how long NetBackup keeps records of when scheduled backups have occurred. However, this setting is not significant for calendar based scheduling.
Multiple copies	If you are licensed for the Inline Tape Copy feature and wish to specify multiple copies for your SAP policy, configure **Multiple copies** on the Application Backup schedule.

Specifying the List of Scripts

The File list in a database policy has a different meaning than the File list has for other policies. Normally, in a Windows-NT policy, you would list files and folders to be backed up. But since you are now configuring a database policy, you will list scripts.

Add scripts only if you are setting up a policy for automatic scheduling. All scripts listed in the Files list will be executed for the Automatic Backup schedules as specified under the **Schedules** tab.

All scripts specified in the Files list are executed during manual or automatic backups. NetBackup will start backups by running the scripts in the order that they appear in the Files list.

▼ **To add scripts to the Scripts List**

1. In the left pane, click **Policies**.

2. In the All Policies pane, expand the policy you want to add the scripts.

3. Right-click on **Files** and choose **New**.

   The Add File dialog box appears. The title bar shows the name of the policy to which you are adding the scripts.
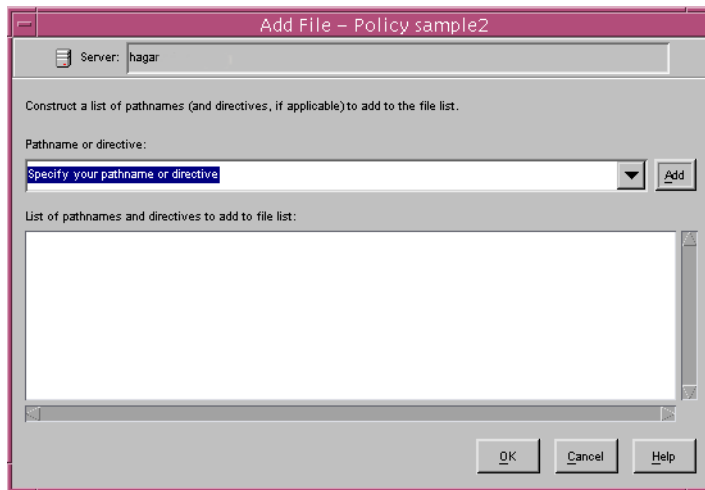
4. Type the name of the SAP script.

   Be sure to specify the full pathname when listing SAP scripts. For example:

   install_path\NetBackup\dbext\sap\scripts\

   Be sure that the SAP scripts listed here are installed on each host in the Client list.

   Refer to "Creating Scripts" on page 46 for details on creating scripts.

5. Click **Add**.

6. To add more scripts, repeat step 4 and step 5.

Adding Clients to a Policy

The client list is the list of hosts on which your NetBackup for SAP on Windows backups will be performed. A NetBackup client must be in at least one policy but can be in more than one.

▼ **To add clients to a policy**

1. In the left pane, expand **Policies**.

2. In the All Policies pane, expand the policy you wish to configure.

3. Right-click on **Clients** and choose **New**.

   The Add Client dialog box appears. The title bar shows the name of the policy where you are adding clients.
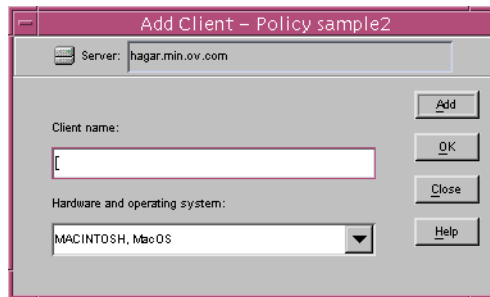
4. In the **Client name** text box, type the name of the client that you are adding.

   On the client the following should be installed:

   - SAP
   - NetBackup client or server
   - NetBackup for SAP on Windows
   - the backup or restore script(s)

5. Choose the hardware and operating system type and click **Add**.

6. If this is the last client, click **OK**. If you are going to add more clients, repeat step 4 and step 5.

Creating Scripts

The following example scripts were included with the NetBackup for SAP on Windows installation:

```
sap_offline_backup.cmd
sap_online_backup.cmd
sap_redo_log_backup.cmd
```

These scripts were installed in the following folder:

```
install_path\NetBackup\dbext\sap\scripts\
```

Be sure to modify these scripts for your environment.

Although each script can have multiple SAP Tools operations, a separate script is required for each type of operation. For example, you need separate scripts for backups and restores.

Caution	Always specify the correct script when configuring automatic backups or when starting operations through NetBackup. NetBackup for SAP on Windows will not generate an error if a restore script is used for a backup operation or a backup script is used for a restore operation.

Instructions for Modifying Scripts

1. If necessary, copy the example scripts to a different directory on your client. SAP scripts can be located anywhere on the client.

2. Modify the `sap_offline_backup.cmd` script.

   a. Use a text editor to open the `sap_offline_backup.cmd` script.

   b. Follow the instructions in the `sap_offline_backup.cmd` script.

Note	Test the scripts you just created. Refer to "Testing NetBackup for SAP on Windows Configuration Settings" on page 54.

`sap_offline_backup.cmd` **script**

```
@REM
@REM $Header: sap_offline_backup.cmd,v 1.3 99/03/31 13:42:03 mdp Stab $
```

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```
@REM
@echo off

REM This environment variable are created by Netbackup (bphdb)

echo SAP_SCHEDULED = %SAP_SCHEDULED%
echo SAP_USER_INITIATED = %SAP_USER_INITIATED%
echo SAP_SERVER = %SAP_SERVER%
echo SAP_POLICY = %SAP_POLICY%


REM --------------------------------------------------------------------------
REM Replace cer below with the Oracle SID of the target database.
REM --------------------------------------------------------------------------


set ORACLE_SID=cer

REM --------------------------------------------------------------------------
REM Replace c:\oracle below with the Oracle home path.
REM --------------------------------------------------------------------------


set ORACLE_HOME=c:\oracle

REM --------------------------------------------------------------------------
REM Replace path with the correct sap archive path.
REM --------------------------------------------------------------------------


set SAPARCH=%ORACLE_HOME%\%ORACLE_SID%\saparch

REM --------------------------------------------------------------------------
REM Replace path with the correct sap backup path.
REM --------------------------------------------------------------------------


set SAPBACKUP=%ORACLE_HOME%\%ORACLE_SID%\sapbackup

REM --------------------------------------------------------------------------
REM Replace path with the correct sap reorg path.
REM --------------------------------------------------------------------------


set SAPREORG=%ORACLE_HOME%\%ORACLE_SID%\sapreorg

REM --------------------------------------------------------------------------
REM Replace path with the correct BRBACKUP path.
REM --------------------------------------------------------------------------


set BRBACKUP=c:\usr\sap\%ORACLE_SID%\sys\exe\run\brbackup

REM Full offline backup

set CMD_LINE=%BRBACKUP% -u internal/ -c -d util_file -t offline -m all
%CMD_LINE%

REM --------------------------------------------------------------------------
REM To communicate with NetBackup's job monitor for an automatic schedule
REM a "STATUS_FILE" variable is created by NetBackup (bphdb) that contains
```

```
REM a path to a file.  This file is check by Netbackup to determine if the
REM automatic schedule was successful.  It is up to the script to write
REM a 0 (passed) or 1 (failure) to the status file to communicate to NetBackup
REM the status of the execution of the script.  The following code echo a 0
REM to %STATUS_FILE% if succcessful and echo a 1 to %STATUS_FILE% for a
REM failure.
REM -----------------------------------------------------------------------

if errorlevel 1 goto errormsg
echo BRBACKUP successful
if "%STATUS_FILE%" == "" goto end
if exist %STATUS_FILE% echo 0 > %STATUS_FILE%
goto end

:errormsg
echo Execution of BRBACKUP command failed - exiting
if "%STATUS_FILE%" == "" goto end
if exist %STATUS_FILE% echo 1 > %STATUS_FILE%

:end
```

Script Parameters

A number of parameters are necessary in SAP scripts to enable SAP utilities to perform backup and restore operations. The parameters can come from one of three sources:

◆ Environmental Variables

◆ Parameter File (init*SID*.sap & init*SID*.utl), where *SID* is the instance.

◆ NetBackup Configuration GUI

The different parameter sources can be used to create different SAP scripts to perform different database backup/restore tasks. For example, the *$SAP_POLICY* can be defined in an SAP script to perform different types of backups (on-line, off-line, or redo logs).

It is also important to note that some environmental variables are created locally when an SAP script is executed through NetBackup's Automatic Scheduler.

When NetBackup's Automatic Scheduler calls an SAP script, the following environmental variables are created.

$SAP_POLICY	Name of the NetBackup SAP policy.
$SAP_SERVER	Name of the NetBackup server.
$SAP_SCHEDULED	Set to 1 if this is an automatic backup (Scheduled SAP).

Enabling Database User Authentication

Because the NetBackup Client service is, by default, started under the SYSTEM account, special attention must also be given to database user authentication. The SYSTEM account will not have permission to connect to the target database if you are using OS Authentication instead of passwords. If you are using OS Authentication, you must run the NetBackup Client service under an account that has SYSDBA privilege. To do this:

1. From the Start menu, open Control Panel.

2. From the Control Panel, open Services.

3. Highlight **NetBackup Client Service** and click on **Stop**.

4. Click **Startup**.

5. From the **Log ON As:** pane, select **This Account**.

6. Type in the account name with SYSDBA privileges.

7. Type in the password.

8. Click **OK**.

9. Click **START** to restart the service.

Configuring the **init_SID_.utl** File

Configure the NetBackup for SAP on Windows by modifying the `backint -p`
`par_file` or the `initSID.utl` file. These are text files submitted to the NetBackup for
SAP on Windows `backint` interface by SAP Tools with the `-p` *par_file* parameter. The
sort_backup_type, *sort_restore_type*, and *custom_sort_file* parameters must be added to
the parameter file to improve performance. The name of the *par_file* is specified on the
util_par_file parameter in the profile file (see "Configuring the initSID.sap File" on
page 52). SAP Tools determines the name of the *par_file* through the profile file.

1. Create a Parameter File.

Copy the parameter file from the NetBackup folder to the
`%ORACLE_HOME%`\database folder. If the Oracle instance is SAP, copy the
NetBackup example `.utl` file to `initSAP.utl` as follows:

```
copy install_path\NetBackup\dbext\sap\scripts\initSAP.utl
   c:\oracle\SAP\database\initSAP.utl
```

If a parameter file already exists, make sure the original copy is saved.

2. Set the parameter to the desired value.

Modify `initSAP.utl` with a text editor. Set parameter *policy, schedule, client, server,
switch_list, switch_sem, switch_log,* and *drives* to valid values. The following steps set
the *policy* parameter.

   a. Use a text editor to open the `initSAP.utl` file.

   b. Find the following line.

```
policy mdp_sap
```

   c. Change `mdp_sap` policy name to the name created in NetBackup.

```
policy Example_SAP
```

Repeat Step 2 for each parameter you would like to change. For example, the
following are parameters that will need to be adjusted for your configuration:

```
policy SAP_backup
schedule Default-Application-Backup
client puffin
server puffin
drives
switch_list  F:\oracle\SID\SAPBackup\.switch.lis
switch_sem   F:\oracle\SID\SAPBackup\.switch.sem
switch_log   F:\oracle\SID\SAPBackup\.switch.log
```

| **Note** | Oracle substitution character (? or @) and environmental variable (*%ORACLE_HOME%*) are not allowed in the *par_file* file. |

Configuring the `init`*SID*`.sap` **File**

Configure the SAP software by notifying the SAP Tools that you are using the NetBackup for SAP on Windows `backint` interface. This is done by modifying a few parameters in the SAP profile file. The *backup_dev_type* parameter needs to be set equal to *util_file* and the *util_par_file* parameter needs to point to the `init(`*SID*`).utl` file.

1. Locate the Profile file.

   The profile file needs to be configured to tell the SAP Tools to use the NetBackup for SAP on Windows `backint` interface. In `%`*ORACLE_HOME*`%\database`, find the existing `init`*SID*`.sap` configuration file. For example, if the instance is SAP, you will find `initSAP.sap`. If one does not exist, copy the sample file from NetBackup as follows:

   ```
   copy install_path\NetBackup\dbext\sap\scripts\initSAP.utl
      c:\oracle\SAP\database\initSAP.sap
   ```

2. Save the Original Profile

   Since the profile file needs to be modified, it is important to save a copy of the original. If problems are encountered, restore the old configuration file. One way to save it is to copy the existing `init`*SID*`.sap` configuration file to `initSAP.sap.org` as follows:

   ```
   cd %ORACLE_HOME%
   cd database
   copy initSAP.sap initSAP.sap.org
   ```

3. Set parameter *backup_dev_type*.

   a. Use a text editor to open the `initSAP.sap` file.

   b. Find the following line.

   ```
   backup_dev_type = tape
   ```

   c. Copy and paste this line under the original.

   ```
   backup_dev_type = tape
   backup_dev_type = tape
   ```

   d. Comment out the original line.

   ```
   #backup_dev_type = tape
   backup_dev_type = tape
   ```

   e. Change *tape* to *util_file*.

```
#backup_dev_type = tape
backup_dev_type = util_file
```

4. Set parameter *util_par_file*.

The next step is to continue to modify text file `initSAP.sap` with a text editor and set the parameter *util_par_file* equal to the `backint` parameter file. The `backint` parameter file is the same file modified in the "Configure the `initSID.utl` File" on page 32. This can be done by the following:

a. Find the following

```
#util_par_file = <file path>
```

b. Copy and paste this line under the original.

```
#util_par_file = <file path>
#util_par_file = <file path>
```

c. Uncomment the original line.

```
#util_par_file = <file path>
util_par_file = <file path>
```

d. Optional: Change the *util_par_file* to the absolute path of the parameter file.

```
#util_par_file = <file path>
util_par_file =?\database\init@.utl
```

Here is what these changes look like:

```
backup_dev_type = util_file
util_par_file = ?\database\init@.utl
```

Note When the profile file is interpreted by the SAP Tools, the ? and @ characters will be substituted with the value assigned to the environmental variables *%ORACLE_HOME%* and *%ORACLE_SID%* respectively.

Testing NetBackup for SAP on Windows Configuration Settings

After you have configured the master server for NetBackup for SAP on Windows, you should test the configuration settings. For a description of status codes, refer to the *NetBackup Troubleshooting Guide for Windows* if you are using a Windows server or the *NetBackup Troubleshooting Guide for UNIX* if you are using a UNIX server.
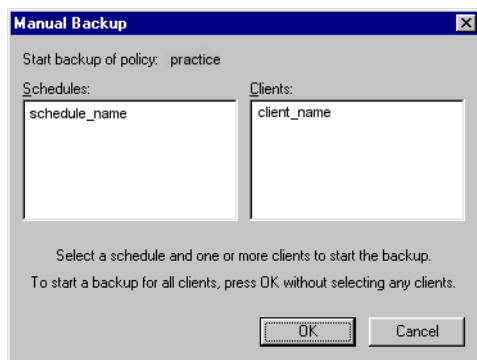
NetBackup Administration Console for Windows

Use this procedure to test a policy configuration from a Windows server or from the Remote Administration Console.

▼ **To test the configuration settings on a Windows server**

1. Log onto the server as administrator.

2. Start the NetBackup Administration Console.

3. In the left pane, click **Policies**. The policy list appears in the right pane.

4. Click on the policy you wish to test.

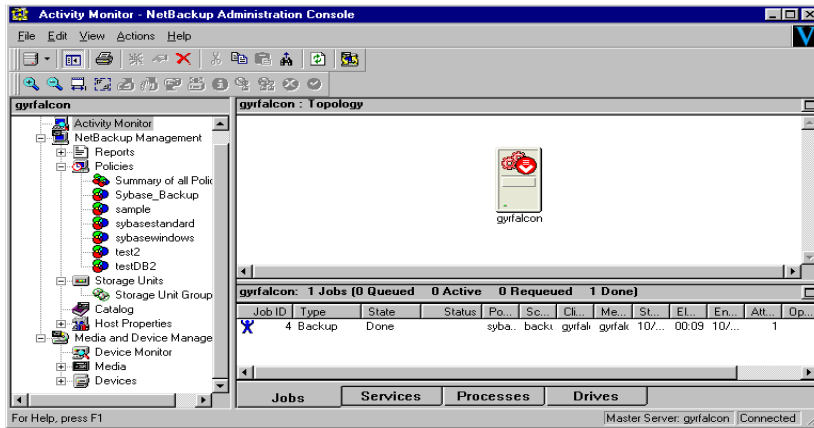5. From the **Actions** menu, click **Manual Backup**.

   The Manual Backup dialog box appears.

   The Schedules pane contains the name of a schedule (or schedules) configured for the policy you are going to test. The Clients pane contains the name of the client(s) listed in the policy you are going to test.

6. Follow the instructions on the dialog box.

7. Click **Activity Monitor** on the NetBackup Administration Console.

If the manual backup does not exit with a successful status, refer to the Troubleshooting chapter.
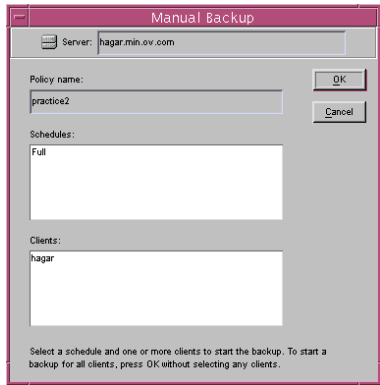
NetBackup Administration Console for UNIX

Use this procedure to test a policy configuration on the NetBackup Administration Console for UNIX.

▼ **To test the configuration settings on a UNIX server**

1. Log onto the server as root.

2. Start the NetBackup Administration Console.

3. In the left pane, click **Policies**.

The right pane splits into an All Policies pane and a details pane.

4. In the All Policies pane, click the policy you wish to test.

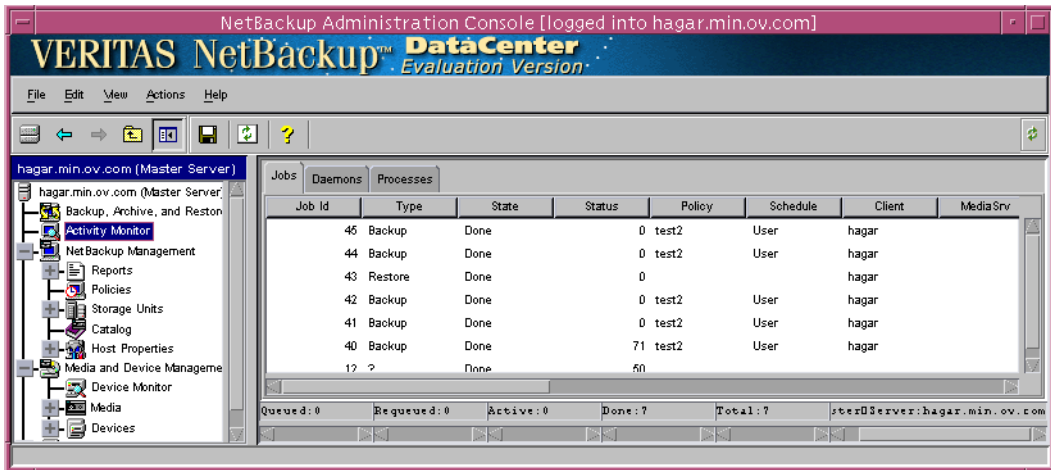**5.** From the **Actions** menu, click **Manual Backup**.

The Manual Backup dialog box appears.

The Schedules pane contains the name of a schedule (or schedules) configured for the policy you are going to test. The Clients pane contains the name of the client(s) listed in the policy you are going to test.

6. Follow the instructions on the dialog box.

7. Click **Activity Monitor** on the NetBackup Administration Console.

If the manual backup does not exit with a successful status, refer to the Troubleshooting chapter.

Testing Multiple Drives and Files

To test multiple drives, you must have:

◆ more than one tablespace to back up

◆ multiple tape drives to write to at the same time

You can also use the MPX value to simulate multiple tape drives.

1. Complete the configuration of NetBackup, NetBackup for SAP on Windows, and SAP Tools as described previously in this chapter.

2. Change the number of drives in `%ORACLE_HOME%\database\initSAP.utl` to equal the number of tape drives (MPX value X number of tape drives = drives). Refer to "drives" on page 86 for examples.

```
drives 2
```

When you perform a backup, you should see two or more backups running, depending upon how many drives you have identified in the `%ORACLE_HOME%\database\initSAP.utl` parameter file. The number of drives in the utility file should match the number of drives multiplied by the MPX value. The NetBackup for SAP on Windows `backint` interface will wait for all backups to complete before reporting success or failure to `brbackup`.

Using NetBackup for SAP on Windows

4

When all installation and configuration is complete, you can start SAP backups and restores through NetBackup.

This chapter contains the following sections:

◆ Performing a Backup

◆ Performing an Archive

◆ Performing a Restore

Caution   Always specify the correct SAP script when configuring automatic backups or when starting operations through NetBackup (see "Creating Scripts" on page 46). NetBackup for SAP on Windows will not generate an error if a restore SAP script file is used for a backup operation or a backup SAP script is used for a restore operation.

Performing a Backup

This section contains the following information.

- ◆ Backup of an SAP Policy
- ◆ Using xbp
- ◆ Using SAP to Perform a Backup

Backup of an SAP Policy

Automatic Backup

The most convenient way to back up your database is to set up schedules for automatic backups. When the NetBackup scheduler invokes a schedule for an automatic backup, the SAP scripts run:

- ◆ In the same order as they appear in the file list
- ◆ On all clients that have them (that is, matching path names)

The SAP scripts will start the database backup.

The instructions in the previous chapter, Configuration, explain how to create and configure a policy that will use the SAP scripts you create to automatically back up your database according to the schedules you specify. To add a new schedule or change an existing schedule for automatic backups, follow the guidelines in "Adding New Schedules" on page 25.

Manual Backup

The administrator can use the NetBackup server software to manually execute an automatic backup schedule for the SAP policy. Refer to "Testing NetBackup for SAP on Windows Configuration Settings" on page 54 for instructions on initiating a manual backup of an Oracle policy.

Using SAP to Perform a Backup

There are two ways to start a backup:

◆ `sapdba` utility menu

◆ `brbackup` command line

When the backup is started through the `sapdba` utility or the `brbackup` command, `brbackup` status messages will appear on the console. These messages report when the database server is started, or stopped. They also report when the backup mode of the tables is changed. The NetBackup for SAP on Windows `backint` interface is then started by the `brbackup` command. `brbackup` submits the files to be backed up.

The NetBackup for SAP on Windows `backint` interface will generate messages for each `bpbackup` program, and will show a progress log for each. Debugging messages and `bpbackup` log messages will also be displayed. During the file-online mode, each database file is backed up, one at a time. The NetBackup for SAP on Windows `backint` interface handles coordination with `brbackup` using a semaphore file.

Once all files are backed up, the full file list is displayed in the format required by the NetBackup for SAP on Windows `backint` interface specification as to success or failure. This format includes a Backup ID (BID) to be used for later restores. SAP Tools will maintain its own log of the backup session. The standard NetBackup logs will keep track of the images created. The NetBackup for SAP on Windows `backint` interface only needs to keep track of the BID date and time. This allows cross-referencing by `brrestore`.

`sapdba` **Off-line Backup**

1. Complete the configuration of NetBackup, NetBackup for SAP on Windows, and SAP Tools as described in "Configuration Using the NetBackup Administration Console for Windows" on page 19 or "Configuration Using the NetBackup Administration Console for UNIX" on page 32.

2. As user sapadm, stop SAP by executing the `stopsap R3` command.

3. Start `sapdba`.

```
_____

SAPDBA V4.0B - SAP Database Administration - on WIN NT 4.0

_____

            ORACLE version: 8.0.4.0.0
            ORACLE_SID    : CER
            ORACLE_HOME   : c:\oracle
            DATABASE      : open
            SAPR3         : not connected

a - Startup/Shutdown instance    h - Backup database
b - Instance information          i - Backup offline redo logs
c - Tablespace administration     j - Restore/Recovery
d - Reorganization                k - DB check/verification
e - Export/import                 l - Show/Cleanup
f - Archive mode                  m - User and Security
g - Additional functions          n - SAP Online Help

q - Quit

Please select ==> h
```

4. Select the Backup database menu item by typing in h.

_____

```
                              Backup database
```
_____

```
                                 Current value
a - Backup function              Normal backup
b - Parameter file               initCER.sap
c - Backup device type           util_file
d - Objects for backup           all
e - Backup type                  offline
g - Query only                   no
h - Special options ...

i - Standard backup              yes
j - Backup from disk backup
k - Restart backup
l - Make part. backups compl.

S - Start BRBACKUP
q - Return

Please select  ==> d
```

5. Select an Object for backup by selecting g and typing PSAPUSER1D.

You will see the backup type is util_file, the backup type is offline_force, and tablespace is PSAPUSER1D.

```
_____

                            Backup database
_____

                               Current value
a - Backup function            Normal backup
b - Parameter file             initCER.sap
c - Backup device type         util_file
d - Objects for backup         PSAPUSER1D
e - Backup type                offline
g - Query only                 no
h - Special options ...

i - Standard backup            yes
j - Backup from disk backup
k - Restart backup
l - Make part. backups compl.

S - Start BRBACKUP
q - Return

Please select  ==> s
```

6. Start the backup by typing s.

If everything is correct, you will first see sapdba and its command, brbackup, perform housekeeping on the Oracle database. brbackup will then start the NetBackup for SAP on Windows backint interface. When the backup is complete, the NetBackup for SAP on Windows backint interface generates a list of files that tells sapdba/brbackup that the backup was successful.

brbackup On-line Backup

You can use brbackup instead of sapdba to perform database backups. In this example we will do an on-line backup. You can change the backup_mode by changing the initSAP.sap parameter file or specifying -t online on the brbackup command.

Here is what these changes look like in initSAP.sap:

```
backup_type = online_file
```

This backup mode allows `sapdba/brbackup` to use a semaphore file with the NetBackup for SAP on Windows `backint` interface. This provides better on-line backup when doing very large files, since only the necessary tablespaces are placed in backup mode. When NetBackup is ready to process another file, it notifies `brbackup`. You can change the `backup_mode` to `online` to test this mode.

1. Complete the configuration of NetBackup, NetBackup for SAP on Windows, and SAP Tools as described in "Configuration" on page 17.

2. As the SAP administrator user, call `brbackup`.

   `brbackup -d util_file_online -t online -m all`

Performing an Archive

An archive is executed in a similar fashion as a backup. The `brarchive` command creates multiple successful backups before deleting the redo log file. NetBackup for SAP on Windows is used for each archive run.

Performing a Restore

To restore a partial or full database, the `sapdba` system should be used to maintain the list of valid restores for specific tablespace or complete database restores. Refer to *BC SAP Database Administration* for restore examples.

Before restoring either individual tablespaces or full databases, the user is prompted prior to deleting an existing copy of the target file. `sapdba` will then invoke the `brrestore` command.

`brrestore` submits the BID and filename list to the NetBackup for SAP on Windows `backint` interface. The `backint` interface will cross-reference the exact date and time to when the backup was made and uses NetBackup to recover the file. The `backint` interface monitors the progress of the restore and reports status back to `brrestore`.

Upon completion, the `backint` interface saves a copy of the NetBackup restore logs for auditing purposes. `sapdba` then provides required database recovery, such as media recovery, and restarts the database server.

Redirecting a Restore to a Different Client

With NetBackup for SAP on Windows you have the option to restore a database to a client other than the one that originally performed the backup. The process of restoring data to another client is called a redirected restore.

The following illustrates a typical redirected restore process.
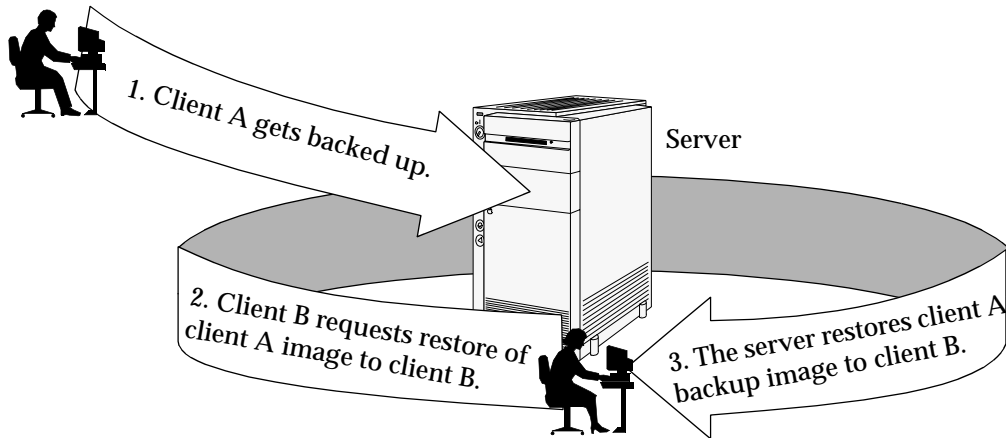
Note that the user on client A was not able to initiate a redirected restore to client B. Only the user on client B, the client receiving the backup image, could initiate the redirected restore.

To perform a redirected restore, you must complete the following steps:

1. Change the name of the destination client to the name of the original source client. There are two ways to make this change:

On the destination client, change the client parameter in the *%Oracle_home%*\initSID.utl parameter file to the name of the client that originally performed the backup.

On the destination client, change the environment variable *$SAP_CLIENT* to the name of the original source client.

Note It is only necessary to adjust one of these settings for a redirected restore. However, another setting may take precedence. If initSID.utl paramters or environmental variables have been previously specified, change the variable or parameter of highest precedence for the redirected restore:

1. SAP_CLIENT (enviromental variable)
2. client (entry in .utl file)

2. Ensure that the NetBackup server is configured to allow the redirected restore:

- Allowing all clients to perform redirected restores

- Allowing a single client to perform redirected restores

- Allowing redirected restores of specific clients' files.

See the *NetBackup System Administrator's Guide - UNIX* or the *NetBackup System Administrator's Guide - Windows NT/2000* for detailed configuration instructions.

3. Perform the restore on the destination client.

Note When the redirected restore is completed, change the settings back to the name of the destination client to enable regular backups.

Troubleshooting   **5**

This chapter provides processes and resources to help you troubleshoot NetBackup for
SAP on Windows, including logs and reports that NetBackup, NetBackup for SAP on
Windows, and the SAP Tools provide. These reports are useful for finding errors
associated with those applications.

This chapter includes the following sections:

◆   NetBackup Reports

◆   Setting the Debug Level

◆   `sapdba` Logs and Messages

NetBackup Reports

The NetBackup server and client software allow you to set up detailed debug logs for troubleshooting problems that occur outside of either NetBackup for SAP on Windows or the SAP Tools. See the *NetBackup Troubleshooting Guide* or the *NetBackup Troubleshooting Guide - Windows NT/2000* for a complete description of debug logs. Also see the *install_path*\NetBackup\logs\README.debug file.

Note These logs do not reveal errors that occur during the execution of the SAP Tools, unless those errors also affect NetBackup for SAP. SAP may (or may not) use the NetBackup for SAP logs for errors in the application. Your best sources for SAP error information are the logs provided by SAP.

Enable the NetBackup for SAP on Windows logs by performing the following steps.

1. Create the following folders on the client:

2. *install_dir*\NetBackup\logs\bphdb
install_dir\NetBackup\logs\backint
Make sure there is share access to the log folders.

The following sections describe the logs created when you create the log directories. Use a text editor to view the contents of the logs.

bphdb Folder on the Client

The *install_dir*\NetBackup\logs\bphdb folder contains the following types of logs. These logs are a good starting place to determine what type of error occurred.

sap_stdout.*mmddyy.hhmmss*.txt

> Unless redirected elsewhere, NetBackup places SAP script output in this file.

sap_stderr.*mmddyy.hhmmss*.txt

> Unless redirected elsewhere, NetBackup places SAP script errors in this file.

mmddyy.log

> bphdb is the NetBackup Database Backup binary. This log contains debugging information for the bphdb process. NetBackup for SAP on Windows uses this client process for SAP script execution. It is invoked when an automatic backup schedule is executed.

backint Folder on the Client

The *install_dir*\NetBackup\logs\backint folder contains the following execution log.

mmddyy.log

This log contains debugging information and execution status for the SAP NetBackup client processes linked to the library program provided with NetBackup for SAP on Windows.

NetBackup Server Reports

NetBackup provides other reports that are useful in isolating problems. One such report is All Logs Entries on the server. See the *NetBackup System Administrator's Guide* for a description of this and other reports.
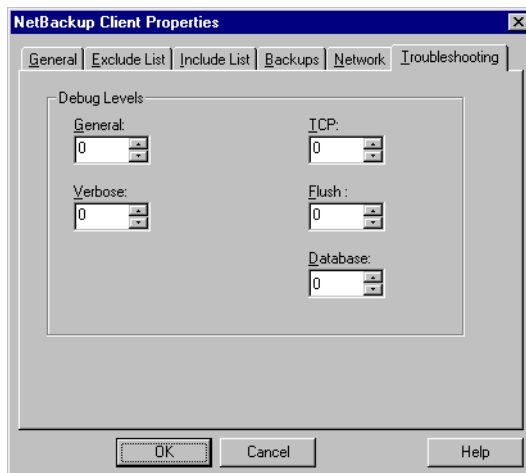
Setting the Debug Level

You can control the amount of information written to the debug log in the
install_dir\NetBackup\logs\backint folder by changing the Database debug level.
The higher the value, the more information is logged. In everyday normal operations, the
default value of 0 is sufficient. However, VERITAS technical support may ask you to set
the value higher when a problem is being analyzed. 5 is the highest possible setting.

▼ **To change the Debug Level**

1. From the Start button, click **Programs**->**VERITAS NetBackup**->**Backup, Archive,
   and Restore**.

   The Backup, Archive, and Restore interface appears.

2. From the File menu, select **NetBackup Client Properties**.

3. In the NetBackup Client Properties dialog box, select the **Troubleshooting** tab.

By default, the settings are zero.

4. Set the Database debug level.

Note Information from both settings will be logged to the same file, mmddyy.log

`sapdba` **Logs and Messages**

The SAP Tools log provides information on the SAP part of the operation. This is the log the database administrator must check to determine the ultimate success or failure of the database backups and restores.

The `sapdba` utility log can view backup and restore logs. You can find them in the `sapdba` menu option: `Show/Cleanup; Show log files/profiles`. The same log information can be found in a few directories for `brbackup/brrestore` log information and `brarchive` log information.

Backup and Restore Folder

%ORACLE_HOME%`\sapbackup`

This directory contains files that represent different types of backups and restores.

`back`*SID*`.log - summary log`
encode timestamp.xyz `- detail logs`

where

> *SID* = a unique name for an Oracle database instance. Also known as System ID.
>
> *encoded timestamp* = a timestamp used in each detail log name which guarantees unique filenames
>
> *x* = a (all), p (partial)
>
> *y* = n (online), f (offline)
>
> *z* = f (utility_file_backup)
>
> *xyz* = rsb (restore backup files)
>
> *xyz* = rsa (restore archive files)
>
> *xyz* = rsf (restore individual files)

Archive Folder

%ORACLE_HOME%`saparch`

This folder contains files that represent different types of archives.

encode timestamp`.sve`	original saved
encode timestamp`.svd`	original saved and deleted

encode timestamp.cpy   original copied/saved a second time

encode timestamp.cpd   original copied/saved a second time and deleted

encode timestamp.dcp   deleted which were saved twice

encode timestamp.dsv   deleted which were saved

Preventing Timeout Failures on Large Database Restores

Large database restores sometimes fail when multiple restore sessions compete for resources. In this situation, a restore session can be delayed waiting for media or device access. If the delay is too long, the restore session will timeout.

This problem can be resolved by increasing the NetBackup Client Read Timeout setting, which will prevent session timeouts and allow the restores to complete successfully.

Use the NetBackup Administration Console on the server to change the properties of each client that contains a database you may need to restore. The default for the Client Read Timeout setting is 300 seconds (5 minutes). For database agent clients, increase the value significantly to prevent timeout errors, e.g. 30 minutes.

`backint` **Command Line**   **A**

The `backint` command line uses the following syntax.

`backint -u` *user id* `-f` *function* [`-t` *type*] `-p` *par_file* [`-i` *in_file*] [`-o` *out_file*]

`-u` *user id*	UID for backup utility user. No default. Required option.
`-f` *function*	This is a required parameter for the `backint` interface. It defines a key value that performs different functions between SAP and NetBackup. One of the following options is required.
`backup`	This is an optional parameter value for the `-f` *function* parameter. It supports and defines `brbackup` and `brarchive` to NetBackup. If backup is specified, NetBackup will perform a backup for SAP.
`restore`	This is an optional parameter value for the `-f` *function* parameter. It supports and defines `brrestore` to NetBackup. If restore is specified, then NetBackup will perform a restore for SAP.
`inquiry`	This is an optional parameter value for the `-f` *function* parameter. It supports and defines `sapdba` to NetBackup. This option is used by `sapdba` when a recovery is performed to get backup information for NetBackup.
`-t` *type*	This is an optional parameter for the `backint` command. It defines backup type, backup of individual files, and character special devices. If it is not specified the default value is `file`.
`file`	This is the default parameter value for the `-t` *type* parameter. It defines when to perform a backup, restore and inquiry function with datafiles, and special character devices. Backups from folders are not supported.

`file_online`	This is an optional parameter value for the `-t` *type* parameter. It allows `brbackup` to set tablespace into #BEGIN/#END backup mode when a related file backup takes place. It is used for on-line backups only. The architecture is based on three control files defined in the `-p` *par_file* parameter.
`-p` *par_file*	This is a required parameter for the `backint` command. It is a text file that contains comments, parameters (required and optional), and parameter values. These parameters determine the backup and restore procedure between NetBackup and SAP Tools. Comments are denoted by # in the first column. Any other character in the first column is considered a valid parameter. A required parameter must be specified with a valid value before the NetBackup for SAP on Windows `backint` interface will execute correctly. An optional parameter can be commented out by a # in the first column. If the optional parameters are specified, they must have valid values for the NetBackup for SAP on Windows `backint` interface to execute correctly. If an invalid parameter name is found, the NetBackup for SAP on Windows `backint` interface will report a warning message and will continue executing. For details on input file contents, refer to the following `-i` *in_file* parameter. The SAP Tools parameter file (profile file; `initSID.sap`) specifies the location of this *par_file*. An example of this file is located in: *install_path*`\NetBackup\dbext\sap\initSAP.utl` For details on input file contents, refer to "backint -p par_file or initSID.utl" on page 85 of this manual.
`-i` *in_file*	This is an optional parameter for the `backint` command. It is a text file, the contents of which may vary, depending on the NetBackup for SAP on Windows `backint` interface function initiated. If this parameter is not specified, the contents of this file is data from standard input. For details on input file contents, refer to "backint -i in_file Contents" on page 77 of this manual.
`-o` *out_file*	This is an optional parameter for the `backint` command. It is a text file that contains process messages for a function. If it is not specified, the output will go to standard output. For details on output file contents, refer to "backint -o out_file Contents" on page 79 of this manual.

`backint -i` *in_file* **Contents**   B

The contents of the input text file will change depending on the function initiated by the NetBackup for SAP on Windows `backint` interface.

Backup Function

For the **backup** function, you may have the following entries.

file1	Set of file names to be saved.
special_file1 size1	Character special (raw) device files and the file size used by Oracle.

Restore Function

For the **restore** function, you may have the following entries.

backup_id file1 [*dest_dir1*]	BIDs of backups. Names of files and/or folders to be restored. Optional destination folder.
[#NULL *file2* [*dest_dir2*]]	Optional. Additional names of files and or folders with a different destination folder.

Inquiry Function

For the **inquiry** function, you may have the following entries.

#NULL	Lists the last backup.
[*backup_id*]	Optional BIDs will list all backups.
[#NULL *file1*]	Optional null with names of files and or folders will list all backups with the specified file/folder names.
[*backup_id file2*]	Optional BIDs and folders of files and or directories will list the specified files or folder names in the specified backups.

`backint -o` *out_file* **Contents** C

The contents of the output text file will change depending on the function initiated by the NetBackup for SAP on Windows `backint` interface.

Backup Function

When a backup function is successfully completed, the output file entry will identify the BID assigned to the backup by NetBackup and will list the files and folders backed up.

`#SAVED` *backup_id file*

When a backup function fails, the output file entry will list the files that were not successfully backed up.

`#ERROR` *file*

Restore Function

When a restore function is successfully completed, the output file entry will identify the BID and list the files restored.

`#RESTORED` *backup_id file*

When a restore function fails, the output file will list the files and directories not found. It will also list the files and folders that were not successfully restored.

`#NOTFOUND` *file*
`#ERROR` *file*

Inquiry Function

When an inquiry function is successfully completed, the output file entry will identify the BID assigned to the backup by NetBackup and/or will list the files backed up.

```
#BACKUP backup_id
#BACKUP backup_id file
```

When an inquiry function fails, the output file lists the files that where not successfully backed up.

```
#ERROR file
```

Environment Variable   **D**

The NetBackup for SAP on Windows `backint` interface will recognize the following environmental variables.

$SAP_SERVER   This environmental variable sets the name of the NetBackup server. It can be used to override the current server and perform a backup to an alternative server. This environmental variable is the same as the `server` parameter in the *par_file* (init*SID*.utl) file and the SERVER option in the NetBackup `bp.conf` file.

$SAP_CLIENT   This environmental variable sets the name of the NetBackup client. It can be used to override the current client and perform an alternate restore to a different client. This variable is the same as the `client` parameter in the *par_file* (init*SID*.utl) file and the *CLIENT_NAME* option in the NetBackup `bp.conf` file.

$SAP_POLICY   This environmental variable sets the name of the NetBackup policy. This policy can be used to define different types of database backups. One policy type can be used to perform offline database backups, and another policy type can be used to perform archive log backups. This environmental variable is the same as the `policy` parameter in the *par_file* (init*SID*.utl) file and the *BPBACKUP_POLICY* option in the NetBackup `bp.conf` file.

$SAP_SCHED   This environmental variable sets the name of the SAP *Backup Policy* schedule. This schedule provides an easy way to switch to a different schedule for each SAP database backup. This environmental variable is the same as the `schedule` parameter in the *par_file* (init*SID*.utl) file and the *BPBACKUP_SCHED* option in the NetBackup `bp.conf` file.

$SAP_DRIVES   This environmental variable sets the number of simultaneous `bpbackup/bprestore` operations the NetBackup for SAP on Windows `backint` interface will execute. This environmental variable is the same as the `drives` parameter in the *par_file* (init*SID*.utl) file.

`bp.conf` File   E

There are a number of parameters that can be specified in either the
install_path\netbackup\bp.conf file or the *$HOME*\bp.conf file. These parameters
will be used by the NetBackup for SAP on Windows `backint` interface if they are not
found as an environmental variable or in the *par_file* (init*SID*.utl) file. The `server`,
`client`, `policy` and `schedule` parameters in the *par_file* (init*SID*.utl) can all be
defined in the bp.conf file. The following is a list of the variable names and definitions.

SERVER	This is the option, in the `bp.conf` file, which names the NetBackup server. This option is the same as the *$SAP_SERVER* environment variable and the `server` parameter in the `-p` *par_file* file.
CLIENT_NAME	This is the option, in the `bp.conf` file, which names the NetBackup client. This option is the same as the *$SAP_CLIENT* environment variable and the `client` parameter in the `-p` *par_file* file.
BPBACKUP_POLICY	This is the option, in the `bp.conf` file, which names the NetBackup policy. This option is the same as the *$SAP_POLICY* environment variable and the `policy` parameter in the `-p` *par_file* file.
BPBACKUP_SCHED	This is the option, in the `bp.conf` file, which names the NetBackup schedule. This option is the same as the *$SAP_SCHED* environment variable and the `schedule` parameter in the `-p` *par_file* file.

See the *NetBackup System Administrator's Guide - UNIX* or the *NetBackup System
Administrator's Guide - Windows NT/2000* for additional information on bp.conf.

`backint -p` *par_file* **or** `init`*SID*`.utl`   **F**

`server`

This is an optional parameter, used to define the machine name of the NetBackup master server. The NetBackup master server is the name of the machine that provides most of the administration and control for NetBackup operations. It contains the NetBackup database. The following is an example entry:

```
server jupiter
```

If the NetBackup for SAP on Windows `backint` interface finds a *$SAP_SERVER* environment variable, the `server` parameter value will be overridden by the *$SAP_SERVER* value. If the `server` parameter is not specified, and there is no environment variable, then the `server` parameter value will default to the SERVER option specified in NetBackup Configuration GUI.

`client`

This is an optional parameter, used to set a machine name that contains the NetBackup client software, an Oracle database, and an SAP environment. In some cases the server and client machine will be the same machine. The following is an example entry:

```
client saturn
```

If the NetBackup for SAP on Windows `backint` interface finds a *$SAP_CLIENT* environment variable, the `client` parameter value will be overridden by the *$SAP_CLIENT* value. If the `client` parameter is not specified, and there is no environment variable, then the `client` parameter value will default to the *CLIENT_NAME* option specified in the NetBackup Configuration GUI. If the value is not specified in the NetBackup Configuration GUI, the NetBackup for SAP on Windows `backint` interface uses the value returned by the `gethostname()` library function.

drives

This is an optional parameter, used to determine the number of `bpbackup/bprestore` commands that will be run. To maximize write performance to a tape, the `drives` value should be set to the number of tape drives multiplied by the MPX value per schedule. Based on the number of drives specified, the NetBackup for SAP on Windows `backint` interface will simultaneously run the same number of `bpbackup/bprestore` commands.

If, for example, MPX is set to 4 and there are two available tape drives, then the `drives` parameter should be set to 8 (4 X 2). The NetBackup for SAP on Windows `backint` interface will run eight `bpbackup/bprestore` jobs at the same time. As a result there will be four data streams going to each tape. The `drives` parameter should be set to the following rule:

`drives` = *Number of drives per policy* X *MPX value in schedule*

The `drives` parameter value should not exceed the Set Maximum Jobs per Client global attribute. The following is an example entry:

```
drives 5
```

If the NetBackup for SAP on Windows `backint` interface finds a *$SAP_DRIVES* environment variable, the `drives` parameter value will be overridden by the *$SAP_DRIVES* value. If the drive parameter is not specified and there is no environment variable, then the NetBackup for SAP on Windows `backint` interface will exit with an error.

policy

This is an optional parameter, used to set the name of an SAP policy type defined in NetBackup. The SAP policy must have a *Backup Policy* schedule defined in order for the NetBackup for SAP on Windows `backint` interface to work. The following is an example entry:

```
policy sap_nb
```

If the NetBackup for SAP on Windows `backint` interface finds a *$SAP_POLICY* environment variable, the `policy` parameter value will be overridden by the *$SAP_POLICY* value. If the policy parameter is not specified, and there is no environment variable, then the `policy` parameter value will default to the *BPBACKUP_POLICY* option in the NetBackup Configuration GUI. By default, if *BPBACKUP_POLICY* is not in any NetBackup Configuration GUI, NetBackup uses the first active SAP policy type it finds for the client with a Backup Policy backup schedule.

policy2

This is an optional parameter, used to set the name of an policy to be used for the secondary SAP backup. The secondary backup is performed for each SAP database backup on files that are needed to track SAP backup information. This option would be used to save the backup information on a different media. If `policy2` is not specified and `schedule2` is specified, then the `policy` parameter value is used.

schedule

This is an optional parameter, used to set the name of a *Backup Policy* schedule associated with an SAP policy type. The schedule can define aspects of the backup such as how long NetBackup retains images, maximum MPX per drive, storage unit, and volume pool. The following is an example entry:

```
schedule sap_full_backup
```

If the NetBackup for SAP on Windows `backint` interface finds a *$SAP_SCHED* environment variable, the `schedule` parameter value will be overridden by the *$SAP_SCHED* value. If the `schedule` parameter is not specified and there is no environment variable, then the schedule parameter value will default to the *BPBACKUP_SCHED* option in the NetBackup Configuration GUI. By default, if *BPBACKUP_SCHED* is not in any NetBackup Configuration GUI then, NetBackup uses the first *Backup Policy* schedule it finds in the first active SAP policy.

schedule2

This is an optional parameter, used to set the name of a *Backup Policy* schedule to be used for the secondary SAP backup. If it is not specified, then the `schedule` parameter value is used.

For each SAP backup, there are two individual backups performed. The first backup is responsible for backing up database data. The second backup is responsible for backing up log files needed to track SAP backup information. Use this parameter to save SAP log files to a different media. This can make database restore/recovery easier. This option can be used to save the backup information to a different volume pool. The following is an example entry:

```
schedule2  sap_backup_information
```

switch_list

This is a required parameter that should be set only if Oracle and SAP reside on different drives. It is used as a control file to communicate with the NetBackup for SAP on Windows NT `backint` interface and `brbackup` for on-line backups. A switch list file is created every time `brbackup` wants to back up a file, or when it wants to indicate that a backup is finished. The `switch_list` parameter must be set to a file path located in:

`%ORACLE_HOME%/sapbackup/.switch.lis`.

The following is an example of a valid entry:

`switch_list  = F:\oracle\SID\SAPBackup\.switch.lis`

switch_sem

This is a required parameter that should be set only if Oracle and SAP reside on different drives. It is used as a control file between the NetBackup for SAP on Windows NT `backint` interface and `brbackup`. After the switch list file has been created and closed, the NetBackup for SAP on Windows NT `backint` interface creates the switch semaphore file and waits until it is deleted by `brbackup`. The `switch_sem` parameter must be set to a file path located in: `%ORACLE_HOME%/sapbackup/.switch.sem`. The following is an example of a valid entry:

`switch_sem  = F:\oracle\SID\SAPBackup\.switch.sem`

switch_log

This is a required parameter that should be set only if Oracle and SAP reside on different drives. It is used as a control file between the NetBackup for SAP on Windows NT `backint` interface and `brbackup`. After the switch semaphore file has been deleted, the NetBackup for SAP on Windows NT `backint` interface opens and reads the switch log file, created by `brbackup`, to determine if the process is successful. The `switch_log` parameter must be set to a file path located in:
`%ORACLE_HOME%/sapbackup/.switch_log`. The following is an example of a valid entry:

`switch_log  = F:\oracle\SID\SAPBackup\.switch.log`

sort_backup_type

This is optional parameter, used to specify one of four different backup sort parameter values [*size* | *custom* | *device* | *drive*]. If it is not specified, it will default to the *size* option.

The following is detailed information on each parameter value.

size

This is the default parameter value for the *sort_backup_type* parameter. The size feature will create bpbackup jobs based upon the number of drives specified in the *par_file* (drives 3). Each file being backed up will be associated with a backup job based on size. For example, if three tape drives are specified, the files will be divided evenly into three bpbackup jobs based on size. So, if there are 25 input files from SAP and three tape drives, then three bpbackup jobs would be running at the same time with the following files in each job.

Input file list from SAP (`brbackup`, `sapdba`)

```
c:\oracle\sap\sapdata1\btabd_1\btabd.data1
c:\oracle\sap\sapdata2\btabi_1\btabi.data1
c:\oracle\sap\sapdata2\clud_1\clud.data1
c:\oracle\sap\sapdata1\ddicd_1\ddicd.data1
c:\oracle\sap\sapdata5\ddici_1\ddici.data1
c:\oracle\sap\sapdata4\el30cd_1\EL30cd.data1
c:\oracle\sap\sapdata1\el30ci_1\el30ci.data1
c:\oracle\sap\sapdata6\es30cd_1\es30cd.data1
c:\oracle\sap\sapdata2\poold_1\poold.data1
c:\oracle\sap\sapdata1\pooli_1\pooli.data1
c:\oracle\sap\sapdata4\protd_1\protd.data1
c:\dev\rdsk\c0t4d0s6  11812864
c:\oracle\sap\sapdata1\roll_1\roll.data1
c:\oracle\sap\sapdata2\sourced_1\sourced.data1
c:\oracle\sap\sapdata3\stabd_1\stabd.data1
c:\oracle\sap\sapdata2\stabi_2\stabi.data2
c:\oracle\sap\sapdata1\temp_1\temp.data1
c:\oracle\sap\sapdata4\user1d_1\user1d.data1
c:\oracle\sap\sapdata2\user1i_1\user1i.data1
c:\oracle\sap\sapdata1\system_1\system.data1
c:\oracle\sap\saplog1\log_g1_m1\log1_m1.dbf
c:\oracle\sap\saplog1\log_g2_m1\log2_m1.dbf
c:\oracle\sap\saplog1\log_g3_m1\log3_m1.dbf
c:\oracle\sap\saplog1\log_g4_m1\log4_m1.dbf
c:\oracle\sap\dbs\cntrlSAP.dbf
```

Backup Job 1

```
size= 36708352: file \name=c:\oracle\sap\sapdata1\roll_1\roll.data1
size= 10493952: file name=c:\oracle\sap\sapdata1\temp_1\temp.data1
size=  5251072: file name=c:\oracle\sap\sapdata1\ddicd_1\ddicd.data1
size=  5251072: file name=c:\oracle\sap\sapdata1\el30ci_1\el30ci.data1
size=  5243392: file name=c:\oracle\sap\saplog1\log_g4_m1\log4_m1.dbf
Total=62947840
```

Backup Job 2

```
size= 15736832: file name=c:\oracle\sap\sapdata1\system_1\system.data1
size=  5251072: file name=c:\oracle\sap\sapdata2\btabi_1\btabi.data1
size=  5251072: file name=c:\oracle\sap\sapdata5\ddici_1\ddici.data1
size=  5251072: file name=c:\oracle\sap\sapdata6\es30cd_1\es30cd.data1
size=  5251072: file name=c:\oracle\sap\sapdata2\poold_1\poold.data1
size=  5251072: file name=c:\oracle\sap\sapdata3\stabd_1\stabd.data1
size=  5251072: file name=c:\oracle\sap\sapdata1\pooli_1\pooli.data1
size=  5251072: file name=c:\oracle\sap\sapdata2\user1i_1\user1i.data1
size=  5243392: file name=c:\oracle\sap\saplog1\log_g1_m1\log1_m1.dbf
size=   231936: file name=c:\oracle\sap\dbs\cntrlSAP.dbf
Total=57969664
```

Backup Job 3

```
size= 11812864: file name=c:\dev\rdsk\c0t4d0s6
size=  5251072: file name=c:\oracle\sap\sapdata2\clud_1\clud.data
size=  5251072: file name=c:\oracle\sap\sapdata4\el30cd_1\EL30cd.data1
size=  5251072: file name=c:\oracle\sap\sapdata4\protd_1\protd.data1
size=  5251072: file name=c:\oracle\sap\sapdata2\sourced_1\sourced.data1
size=  5251072: file name=c:\oracle\sap\sapdata2\stabi_2\stabi.data2
size=  5251072: file name=c:\oracle\sap\sapdata4\user1d_1\user1d.data1
size=  5251072: file name=c:\oracle\sap\sapdata1\btabd_1\btabd.data1
size=  5243392: file name=c:\oracle\sap\saplog1\log_g2_m1\log2_m1.dbf
size=  5243392: file name=c:\oracle\sap\saplog1\log_g3_m1\log3_m1.dbf
Total=59057152
```

Note The number of drives specified does not have to equal the number of physical tape drives. The number of drives correlates to the number of simultaneous bpbackup jobs run by the NetBackup for SAP on Windows NT backint interface. For example, if you had 10 SAP files and three tape drives, you can specify 10 drives in the *par_file* (init*SID*.utl). This would cause 10 bpbackup jobs with one file for each bpbackup job. bpsched will handle all of the job scheduling. Initially, three bpbackup jobs would be active and the other seven jobs would be queued. You can increase the number of active jobs and data throughput, by increasing the multiplex value for the policy.

custom

This is a parameter value for *sort_backup_type* parameter. If `custom` is specified, the *custom_sort_file* parameter needs to be set to a valid file path. An SAP Tools end-user must create the *custom_sort_file* file (see "custom_sort_file" on page 93).

device

This is a parameter value for *sort_backup_type* parameter. This parameter value will create `bpbackup` jobs based on a file's device id. The number of tape drives specified in the `int`*SID*`.utl` file will not be used. For example, if there are 12 files requested for backup, and they reside on two different devices (X and Y), then two `bpbackup` jobs will be forked. The first job will contain all the files associated with device X and the next job will contain all the files on device Y. The following is an example of the sort by device option:

Input file list from SAP (`brbackup, sapdba`)

c:\oracle\sap\sapdata1\btabd_1\btabd.data1
c:\oracle\sap\sapdata2\btabi_1\btabi.data1
c:\oracle\sap\sapdata2\clud_1\clud.data1
c:\oracle\sap\sapdata1\ddicd_1\ddicd.data1
c:\oracle\sap\sapdata5\ddici_1\ddici.data1
c:\oracle\sap\sapdata4\el30cd_1\EL30cd.data1
c:\oracle\sap\sapdata1\el30ci_1\el30ci.data1
c:\oracle\sap\sapdata6\es30cd_1\es30cd.data1
c:\oracle\sap\sapdata2\poold_1\poold.data1
c:\oracle\sap\sapdata1\pooli_1\pooli.data1
c:\oracle\sap\sapdata4\protd_1\protd.data1
c:\dev\rdsk\c0t4d0s6 11812864

Backup Job 1 (all have the device id X)

```
c:\oracle\sap\sapdata1\btabd_1\btabd.data1
c:\oracle\sap\sapdata2\btabi_1\btabi.data1
c:\oracle\sap\sapdata2\clud_1\clud.data1
c:\oracle\sap\sapdata1\ddicd_1\ddicd.data1
c:\oracle\sap\sapdata5\ddici_1\ddici.data1
c:\oracle\sap\sapdata4\el30cd_1\EL30cd.data1
c:\oracle\sap\sapdata1\el30ci_1\el30ci.data1
c:\oracle\sap\sapdata6\es30cd_1\es30cd.data1
c:\oracle\sap\sapdata2\poold_1\poold.data1
c:\oracle\sap\sapdata1\pooli_1\pooli.data1
c:\oracle\sap\sapdata4\protd_1\protd.data1
```

Backup Job 2 (all have the same device id Y)

```
c:\dev\rdsk\c0t4d0s6   11812864
```

> **Note** The implementation is based on the *st_dev* value from stat() function. This identifies a file partition.

drive

This is a parameter value for the *sort_backup_type* parameter. It will create bpbackup/bprestore jobs based off of the number of simultaneous backup jobs specified by the *drives* parameter in the *par_file* (init*SID*.utl) file.

For example, if there are three tape drives and 10 SAP files, the following distribution will occur:

Input file list from SAP

```
c:\oracle\sap\sapdata1\roll_1\roll.data1
c:\oracle\sap\sapdata2\sourced_1\sourced.data1
c:\oracle\sap\sapdata3\stabd_1\stabd.data1
c:\oracle\sap\sapdata2\stabi_2\stabi.data2
c:\oracle\sap\sapdata1\temp_1\temp.data1
c:\oracle\sap\sapdata4\user1d_1\user1d.data1
c:\oracle\sap\sapdata2\user1i_1\user1i.data1
c:\oracle\sap\sapdata1\system_1\system.data1
c:\oracle\sap\saplog1\log_g1_m1\log1_m1.dbf
```

Backup/Restore Job 1

```
c:\oracle\sap\sapdata1\roll_1\roll.data1
c:\oracle\sap\sapdata2\stabi_2\stabi.data2
c:\oracle\sap\sapdata2\user1i_1\user1i.data1
```

Backup/Restore Job 2

```
c:\oracle\sap\sapdata2\sourced_1\sourced.data1
c:\oracle\sap\sapdata1\temp_1\temp.data1
c:\oracle\sap\sapdata1\system_1\system.data1
```

Backup/Restore Job 3

```
c:\oracle\sap\sapdata3\stabd_1\stabd.data1
c:\oracle\sap\sapdata4\user1d_1\user1d.data1
c:\oracle\sap\saplog1\log_g1_m1\log1_m1.dbf
```

custom_sort_file

This is optional parameter, used only when the custom option is specified on either the *sort_backup_type* parameter or the *sort_restore_type* parameter. When custom is specified, the custom_sort_file parameter must be set to a valid file. The value must be a full path name to a custom sort file and must have public permissions. The following is an example of an entry:

install_path\NetBackup\dbext\SAP\Scripts\sap_custom_sort_file

The custom_sort_file must include two fields. The first field groups a set of files to a particular bpbackup job. Use the second field, file path name, to map the SAP backup file list to a group ID.

> **Note** Restore will fork another job for raw partition files, if they are grouped with regular files.

> **Note** If custom sort is not being used then the custom_sort_file parameter does not have to be specified in the *par_file* init*SID*.utl file (or it does not have to equal a valid file path).

Example of a Custom Sort File

```
1 c:\oracle\sap\sapdata1\btabd_1\btabd.data1
1 c:\oracle\sap\sapdata2\btabi_1\btabi.data1
1 c:\oracle\sap\sapdata2\clud_1\clud.data1
1 c:\oracle\sap\sapdata1\ddicd_1\ddicd.data1
1 c:\oracle\sap\sapdata5\ddici_1\ddici.data1
1 c:\oracle\sap\sapdata4\el30cd_1\EL30cd.data1
1 c:\oracle\sap\sapdata1\el30ci_1\el30ci.data1
1 c:\oracle\sap\sapdata6\es30cd_1\es30cd.data1
1 c:\oracle\sap\sapdata2\poold_1\poold.data1
1 c:\oracle\sap\sapdata1\pooli_1\pooli.data1
1 c:\oracle\sap\sapdata4\protd_1\protd.data1
1 c:\dev\rdsk\c0t4d0s6
2 c:\oracle\sap\sapdata1\roll_1\roll.data1
2 c:\oracle\sap\sapdata2\sourced_1\sourced.data1
2 c:\oracle\sap\sapdata3\stabd_1\stabd.data1
2 c:\oracle\sap\sapdata2\stabi_2\stabi.data2
2 c:\oracle\sap\sapdata1\temp_1\temp.data1
2 c:\oracle\sap\sapdata4\user1d_1\user1d.data1
2 c:\oracle\sap\sapdata2\user1i_1\user1i.data1
2 c:\oracle\sap\sapdata1\system_1\system.data1
2 c:\oracle\sap\saplog1\log_g1_m1\log1_m1.dbf
2 c:\oracle\sap\saplog1\log_g2_m1\log2_m1.dbf
```

```
2 c:\oracle\sap\saplog1\log_g3_m1\log3_m1.dbf
2 c:\oracle\sap\saplog1\log_g4_m1\log4_m1.dbf
2 c:\oracle\sap\dbs\cntrlSAP.dbf
```

Based on the above custom sort file, if SAP submits the entire file list to be backed up, there would be two bpbackup jobs running at the same time. One job would have all the files that have a 1 in the first field. The second job would have all of the files that have a 2 in the first field. The following is a list of jobs and associated files:

Backup/Restore Job 1

```
c:\oracle\sap\sapdata1\btabd_1\btabd.data1
c:\oracle\sap\sapdata2\btabi_1\btabi.data1
c:\oracle\sap\sapdata2\clud_1\clud.data1
c:\oracle\sap\sapdata1\ddicd_1\ddicd.data1
c:\oracle\sap\sapdata5\ddici_1\ddici.data1
c:\oracle\sap\sapdata4\el30cd_1\EL30cd.data1
c:\oracle\sap\sapdata1\el30ci_1\el30ci.data1
c:\oracle\sap\sapdata6\es30cd_1\es30cd.data1
c:\oracle\sap\sapdata2\poold_1\poold.data1
c:\oracle\sap\sapdata1\pooli_1\pooli.data1
c:\oracle\sap\sapdata4\protd_1\protd.data1
c:\dev\rdsk\c0t4d0s6
```

Backup/Restore Job 2

```
c:\oracle\sap\sapdata1\roll_1\roll.data1
c:\oracle\sap\sapdata2\sourced_1\sourced.data1
c:\oracle\sap\sapdata3\stabd_1\stabd.data1
c:\oracle\sap\sapdata2\stabi_2\stabi.data2
c:\oracle\sap\sapdata1\temp_1\temp.data1
c:\oracle\sap\sapdata4\user1d_1\user1d.data1
c:\oracle\sap\sapdata2\user1i_1\user1i.data1
c:\oracle\sap\sapdata1\system_1\system.data1
c:\oracle\sap\saplog1\log_g1_m1\log1_m1.dbf
c:\oracle\sap\saplog1\log_g2_m1\log2_m1.dbf
c:\oracle\sap\saplog1\log_g3_m1\log3_m1.dbf
c:\oracle\sap\saplog1\log_g4_m1\log4_m1.dbf
c:\oracle\sap\dbs\cntrlSAP.dbf
```

policy_log

policy_log is optional and is the name of a policy to be used for backing up a second copy of an archive log. If this option is specified then two backups will be performed on the same archive log. The first backup will go to the policy name option and the second backup will go to the policy_log name option.

```
policy_log sap_archive_logs
```

sched_log

sched_log is optional and is the name of a schedule to create a second backing up of an archive log. If this option is specified, then two backups will be performed on the same archive log. The first backup will go to the schedule option and the second backup will be go to the sched_log and option. The sched_log name must be a valid schedule name under the policy_log name option, otherwise it must be a valid schedule name under the policy name option.

```
sched_log Default-Policy
```

second_secondary_archive

second_secondary_archive is an optional parameter that can have a value of 0 or 1. If value is one (1), then 2 copies of secondary backup will be made. This parameter will have an effect only if policy_log and/or sched_log are specified. The first backup will go to the policy name option and the second backup will go to the policy_log name option. Furthermore, it will support brarchive but it will have no effect on brbackup.

retry_backup

retry_backup is an optional parameter and should be set to the number of retries for a failed backup. If this option is specified BACKINT will retry a failed bpbackup job. The number of retries is determine by the value on the retry_backup parameter.

```
retry_backup 2
```

fail_backup

`fail_backup` is optional and is used to stop the backup process immediately when an error occurs. The standard behavior of `BACKINT` is to continue processing even in the event of an error and then report what files failed and what files were successful. If this parameter is specified, then `BACKINT` will stop process on the first error and report failures for all the files that were not backed up.

`fail_backup`

Note `fail_backup` only pertains to a specific kind of online backup. It is effective only when tablespace is set to #BEGIN/#END backup mode and when a related file backup takes place. This means that `BACKINT` has to be called with "-t file_online" parameter.

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